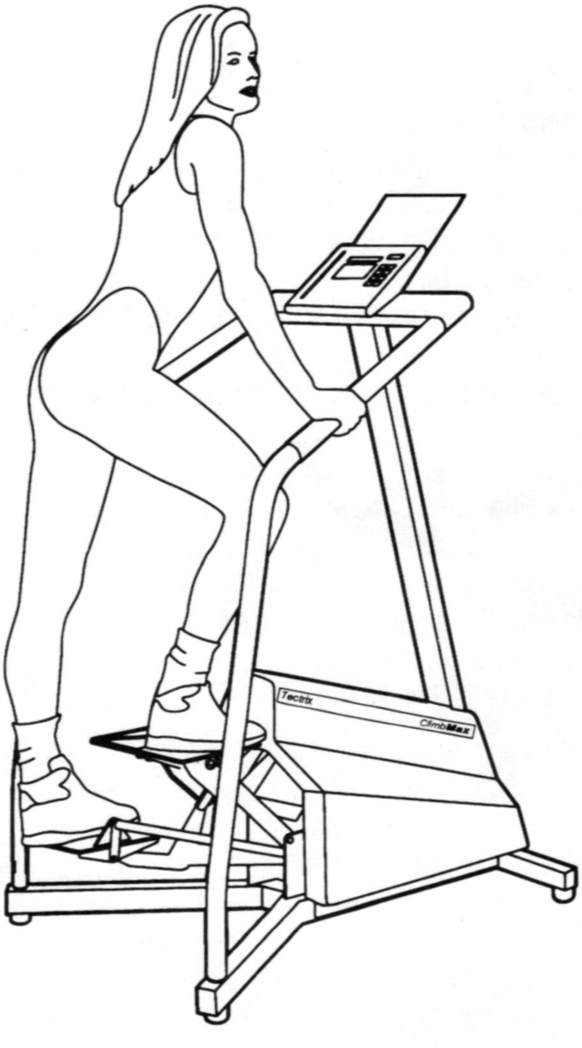
*Climb*__Max__

MADE IN U.S.A.

Everyone Should Be This Well Built



THIS MANUAL, (INCLUDING PART NUMBERS), APPLIES TO THE 'INSTITUTIONAL STYLE' *CLIMB*__*MAX*__, SERIAL NUMBER 166190 AND UP, MANUFACTURED JULY 1993 OR LATER. FOR OPERATION AND PART NUMBER INFORMATION FOR *CLIMB*__*MAX*__ MODEL 150 (SERIAL NUMBERS PRIOR TO 166190) REFER TO THE *CLIMB*__*MAX*__ MODEL 150 OWNERS MANUAL (part number 03001).

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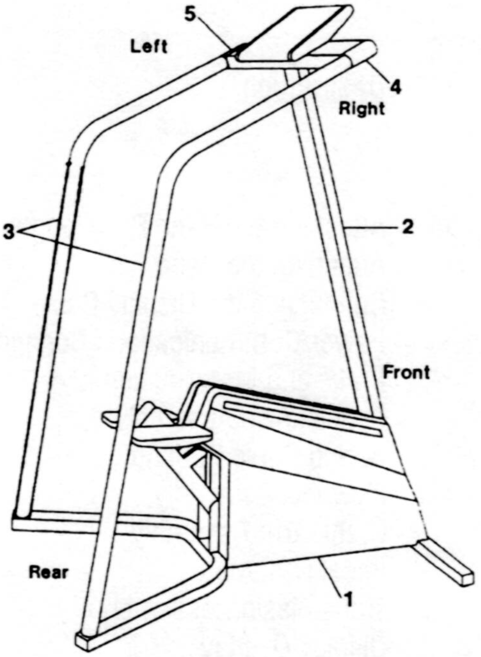
1. ASSEMBLY INSTRUCTIONS

The *Climb****Max*** is quite easy to assemble and should take around 30 minutes to complete. It will require the following common tools:

1/4" Allen Wrench,
3/16" Allen Wrench,
Medium Phillips Screwdriver (#2)
7/16" socket and ratchet
1/2" socket and ratchet



Unpacking your new *Climb****Max***

Remove the Chassis base from the pallet by removing the clamps and screws (use the 7/16" socket and ratchet). Remove all the parts from the box and check that they are all present. **CAUTION:** Do not at any time lean the display console upright tube up on its end. The display ribbon cable could be damaged.

Parts List

#	*Part Name*	*Part #*	*Qty*
1	Main Chassis Base (WHT, BLK, GRAY)	Color	1
2	Hand Rail Upright		1
3	Hand Rails (WHT, BLK, GRAY)	Color	2
	Ship Kit (Contains the Following)		1
4	Right Hand Rail Clamp	53003	1
5	Left Hand Rail Clamp	53006	1
6	5/16"-18 x 2" Socket Screws	41011	2
7	5/16" Flat Washers	53017	2
8	5/16" Lock Washer	53018	2
9	1/4"-20 x 1/14" Socket Screws	41012	4
10	1/4" Flat Washer	53019	4
11	#10-24 x 1/2" Self-Tapping Screw	41006	6
12	Hand Rail End Caps	40006	2
13	Telephone Cable	61033	1
14	Termination Plug	61026	1
15	Power Cord	14007	1
16	Owners Manual	13010	1
17	Reading Rack	61029	1
18	Maintenance Manual	03012	1
19	Friction Belt with Button Hole	61077	1

Attaching The Hand Rail Upright

Attach the hand rail upright (2) to the chassis (1) using two 5/16" screws (6), flat washers (7) and lock washers (8) as shown in Fig. 1. Make sure that the display cable goes through the slot and the display is facing toward the chassis. Finger tighten screws, wrench tighten after hand rails are installed.

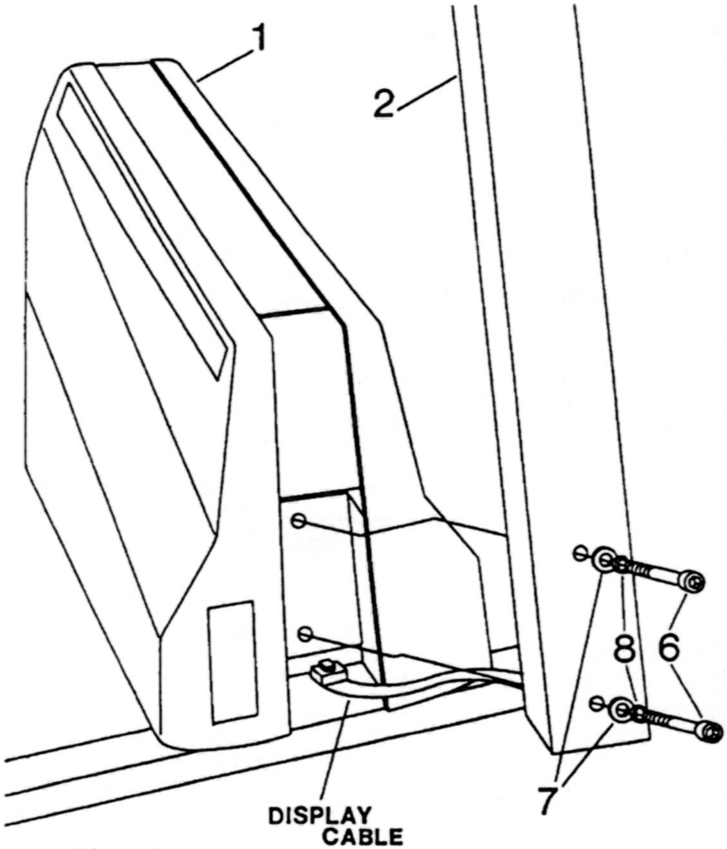


Fig. 1

Attaching the Hand Rails

Insert the clamps (5 & 6) into the upright so that the threaded holes are facing up to check the fit and to see how they insert, then remove the clamps (you may need a soft mallet to tap the clamps in). Slip the hand rails (3) over the black nylon plugs on the rear foot. Slip the right (4) and left (5) clamps over the hand rails so that the threaded holes face up when pushed into the upright (2) as shown in Fig. 3. The easiest way to insert the clamps (5 & 6) into the upright (2) is to check the alignment of the clamps with the uprights. **It may be necessary to twist the handrail (4) towards the display then pull the handrail away from the display without allowing it to twist to get the proper alignment. If this is difficult, use a 1/2" socket and loosen the 5/16" bolt that holds the black nylon plug underneath the rear foot. This allows easy alignment of the handrail.** Screw in the 1/4" screws (9) with the flat washers (10) but do not tighten. Move the upright forward or backward to locate the hand rails 1/2" (inside) from the edge of the clamp (see Fig. 2). If the upright will not move, loosen the 5/16" screws at the base of the upright. Tighten the 1/4" screw until the edge of the clamp is flush with the top surface of the upright. Tighten the four #10 screws (11) as shown. Now the 5/16" screws at the base of the upright can be tightened and the hand rail end caps (12) can be inserted.

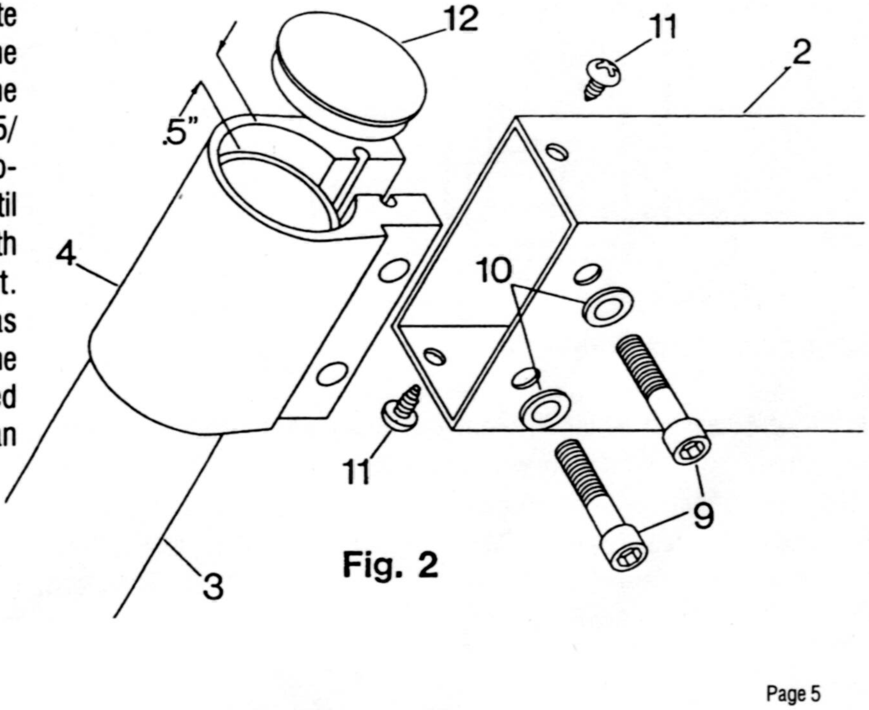


Fig. 2

Connecting The Display Cable

Lay the *Climb***Max** on its right side and locate the display cable. As shown in Fig. 3, fold the display cable (A), attach the cable to the connector (B). Stand the ClimbMax up.

Leveling the *Climb***Max**

Move the *Climb***Max** to where it will be used. Check the level of the *Climb***Max** by pressing on both sides of the front foot. If it rocks back and forth, lower or raise one of the glides on the front foot by loosening the lock nut and screwing the glide in or out. Once it is level, tighten the glide lock-nuts.

Power Connector

The *Climb***Max** has both a power in (A) and power out (B) connector (see Fig. 4). This allows you to string power from one *Climb***Max** to the next and eliminates the need for extension cords. One end of the power cord (15) plugs in to the power in (A) and the other end plugs into either the power out (B) of the next ClimbMax or the wall socket. (C) is the power switch.

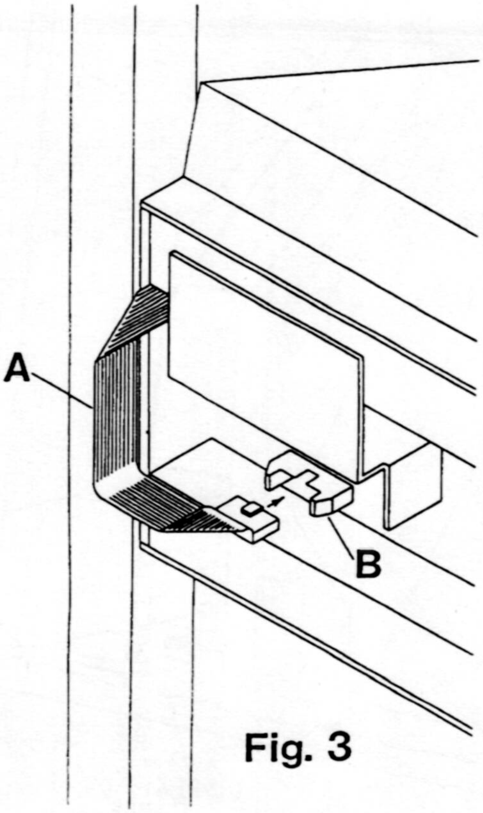


Fig. 3

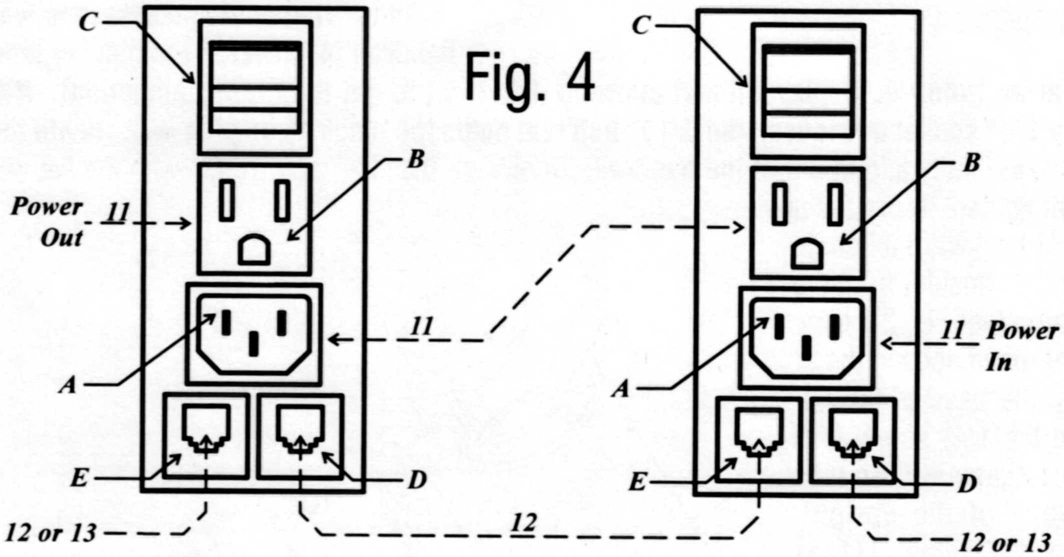


Fig. 4

Communications Connectors

The *Climb***Max** has a built-in serial port designed to interface to other *Climb***Max**es or a host computer. A maximum of eight *Climb***Max**es can be linked together and races among 2 to 8 *Climb***Max**es are possible with up to four different races occurring simultaneously. If you have more than one *Climb***Max**, plug in a telephone type cable (13) from the Out Jack (D) of each climber to the In Jack (E) of the next *Climb***Max** and continue until all *Climb***Max**es are connected (see Fig. 4). Then terminate the first In Jack (E) and the last Out Jack (D) with the plugs (14) provided to complete the communication ring.

2. SETUP MODE

Setup Mode is used to adjust program times, to select various options, including Prompted or Step and Go operation, and to set the jackpot count.

Enter Setup Mode by holding the ***DISPLAY SHIFT*** key (Model 150 climbers use the Shift key) while turning the *Climb**Max*** on. The readouts show SETUP MODE and the Interval display shows a moving pattern.

The keys have special functions in Setup Mode:

DISPLAY SHIFT or ENTER KEY	Scroll Through Programmable Options
⇧	Increase value or change option
⇩	Decrease value or change option
HELP	Display a brief message about the current option
CLEAR	Clear the display or exit setup

CLEAR restores the SETUP MODE sign-on if a programmable time or option or the Jackpot count is being displayed. If the sign-on is displayed, ***CLEAR*** exits Setup Mode and displays the normal TECTRIX *Climb**Max*** sign-on. If any changes were made, the new values are written to memory at this time.

If you make a mistake in Setup Mode and you haven't used ***CLEAR*** to exit, you can restore the previous setup values by turning the climber off and on again. In other words, no permanent changes are made until you press ***CLEAR*** and TECTRIX *Climb**Max*** is displayed.

Programmable Options

SHIFT displays the following options, one at a time:

Option	Factory Setting	Alternatives
1. Maximum Time	MAX TIME = 30	(5-60)
2. First Time	FIRST TIME = 20	(5-60)
3. Time-out Period	TIME OUT = 0:30	NONE, 30, 1:00, 2:00
4. Prompting	PROMPTED	STEP AND GO
5. Measurement system	FEET AND POUNDS	METRIC READOUT
6. Quick Race Access	ANNOUNCE RACES	NO RACE ANNOUNCE
7. Speaker Control	BEEP ON	BEEP OFF

Press ⇧ or ⇩ to change the displayed value or switch between alternatives. Press ***ENTER*** to advance to the next option. The ***HELP*** key provides a brief message about the current option. When all options have been entered, SETUP MODE reappears.

PROGRAMMABLE TIMES

1. MAX TIME

The length of the longest workout can be adjusted in 5-minute increments from 5 to 60.

2. FIRST TIME

The number of minutes first offered after weight has been entered also ranges from 5 to 60. It can't be longer than the maximum time.

3. TIME OUT

The length of time that the climber retains its settings before resetting and displaying the sign-on message if the user quits stepping. The period can be set to thirty seconds, one minute, two minutes, or NONE, which keeps it from timing out.

OPTIONS

4. PROMPTING

Prompted	Step and Go
Prompting begins when you press a key or when you start climbing.	If you start climbing without pressing a key, the climber starts in Manual. If you press a key first, prompting begins. Pressing ENTER in Manual always begins the prompt-in sequence.

5. MEASUREMENT SYSTEM

Feet and Pounds	Metric Readouts
Distance is displayed in feet and weight is entered in pounds.	Distance is displayed in meters and weight is entered in kilograms

6. QUICK RACE ACCESS

Announce Races	No Race Announce
Idle climbers display a message during a race countdown, and anyone can join by just pressing *ENTER.*	No special handling for races.

7. SPEAKER CONTROL

Beep On	Beep Off
The speaker operates.	Turns the speaker off completely.

3. TEST MODE

Test Mode is used to test the climber's electronic hardware. You enter Test Mode by holding the ***ENTER*** key down while turning the *Climb***Max** on. All the displays light up as long as you hold the key down. When you release the key, the readouts show the version number of the microprocessor software and the state of the slack switch (SLACK or TIGHT). The Interval and speedometer displays show moving patterns.

The keys have these special functions in Test Mode:

DISPLAY SHIFT	Display odometer and RPM sensor data
⇧	Loosen Belt
⇩	Tighten Belt
ENTER	Test LED digit groups
HELP	Test LED Segments
CLEAR	Clear Function display or Exit

The indicators show the state of the various input/output signals:

Distance	Smart Link Out	off
Program/Level	Smart Link In	off
Calories	Slack Switch	on
Calories/Hr	Heart Rate Sense	off
Elapsed Time	RPM sensor off	-
Time Remaining	RPM sensor on	-

The ⇧ and ⇩ keys run the belt tensioning motor as long as you hold them down. Don't hold the ⇧ to loosen the belt for too long, or you may tangle or unsnap the belt.

SHIFT displays the odometer reading (the total distance climbed). The Interval display shows a graphic display of the output of the speed sensor. At high speeds only the bottom row is lit; at low speeds the entire display lights. Except at very low speeds the columns ought to be nearly the same. Variations in height of more than one LED may indicate a problem with the RPM sensor or its encoder disk.

SHIFT also begins and ends a simple test of the Smart Link electronics. The Distance indicator should flicker when the test begins; if the climber's In and Out jacks are connected together, both the Distance and Program/Level indicators should turn on steadily.

ENTER lights up each display grouping (a matrix column together with an alphanumeric digit or a group of sixteen LED's in the bar graph) in turn to locate shorted display drive lines.

HELP lights up each display segment in order to locate segments that are shorted together.

CLEAR restores the version readout if the odometer reading or a display test pattern is displayed; otherwise it exits Test Mode and displays the TECTRIX *Climb***Max** sign-on.

MAINTENANCE

This section covers maintenance that should be regularly performed to minimize wear and to keep the *Climb**Max*** in top operating order. The following recommendations are for heavy institutional use (8 or more hours daily, 20 thousand feet climbed) and can be scaled down accordingly.

Required Maintenance

#	Maintenance Procedure	Period	Feet Climbed
4.	Cleaning	Daily	
5.	**Drive Cable / Clevis Replacement**	**8 - 10 Months**	**5 Million**
6.	Pedal / Cable Clevis Lubrication	Weekly	
7.	Clutch Bearing Lube,	Yearly	7 Million
	Chain, Crank Arm & Parallel Shaft Lube	3 - 6 Months	3 Million
8.	Friction Belt Replacement / Switch Ends	3 Months	2 Million

4. Cleaning

Keeping the *Climb**Max*** clean helps to prevent rust and dirt from getting into the moving parts. The *Climb**Max*** should be wiped down at least once a day and club members should be encouraged to wipe off the climber after they use it. Most household cleaners are fine to use on the *Climb**Max*** except for those that have abrasives. Solvents should not be used on any plastic parts. A stiff scrub brush works well for cleaning dirt off the pedals. Scratches or chips in the paint should be touched up to prevent rust.

5. Drive Cable / Clevis Bearing & Bolt Replacement

Drive Cable - Fig. 9, Part #12 and Fig. 7, Part # 2.
Clevis Bearing & Bolt - Fig. 9, Part # 4 & #10.

The drive cables and clevis bearing & bolt should be replaced every 8 to 10 months or 5 million feet climbed. The cables wear internally, darkening with use. A black cable is a worn cable and will eventually break (see section 34 for replacement).

The clevis bearing & bolt should be inspected when replacing a drive cable. A corroded bolt will quickly wear through the bearing. This will result in damage to the crank arm leading to an expensive repair (see section 37 for replacement).

6. Pedal / Cable Clevis Lubrication

Pedal Parallel Arm Bearing (see Fig. 10, Part #4)
Cable Clevis Bearing (see Fig. 9, Part #4)

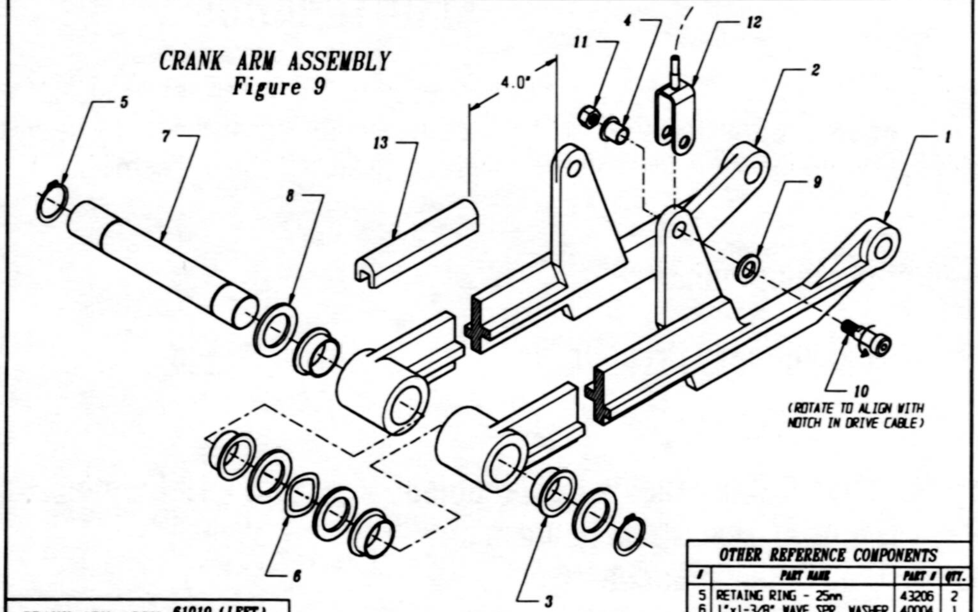
A few drops of light machine oil (example: 'TRI-FLO' or 3-in-1 oil) each week will improve wear life. Make sure to wipe off excess oil as it will attract dirt. Inspect the clevis action. The clevis must swivel freely.

7. Clutch Bearing, Chain, Crank Arm & Parallel Shafts Lubrication

7.1 Clutch Bearing Lubrication

Remove the cover. See Fig. 11, item #7. Apply a few drops of **90 weight gear oil only,** in the hole.

CRANK ARM ASSEMBLY
Figure 9



CRANK ARM ASSY. 61010 (LEFT) 61147 (RIGHT)

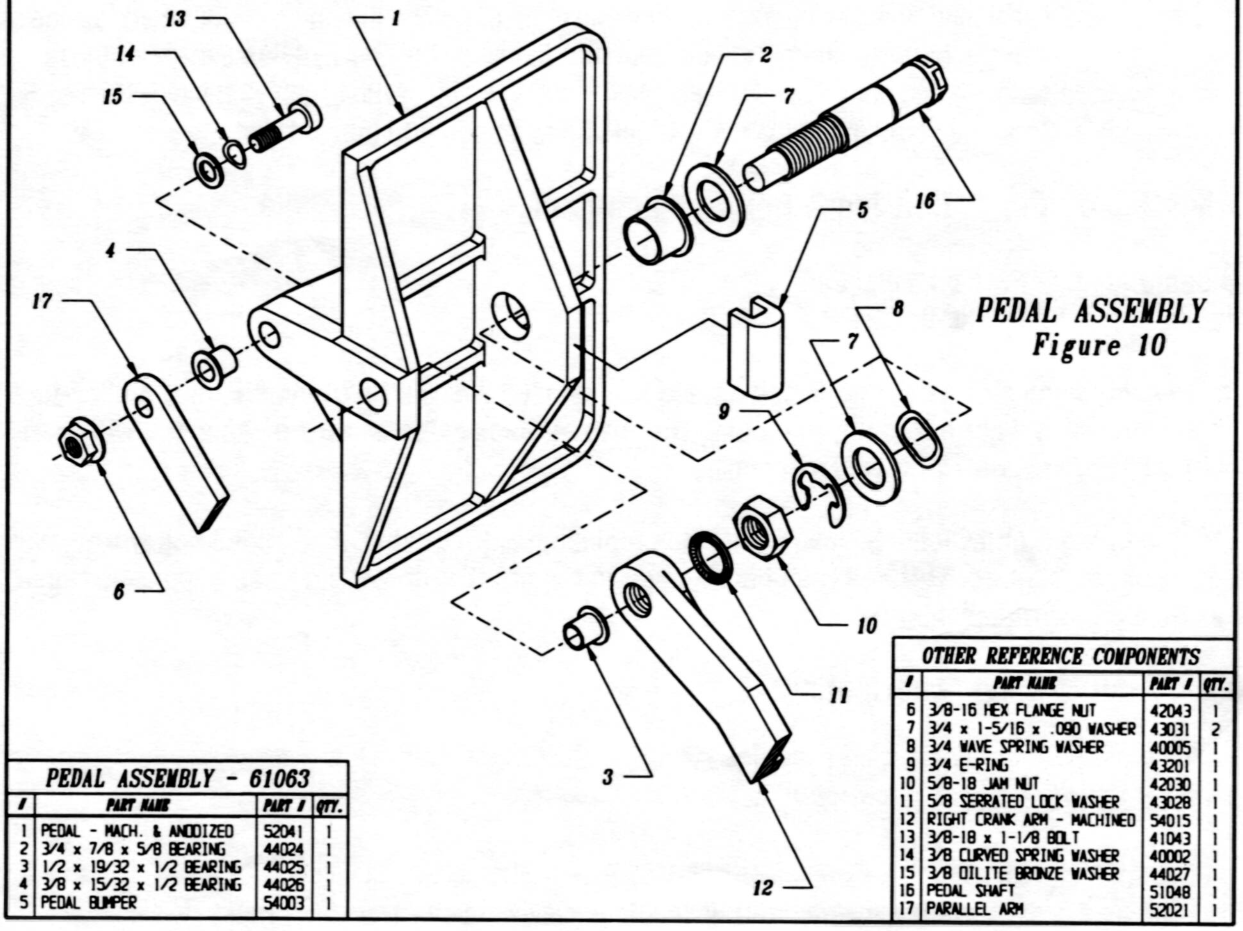
#	PART NAME	PART #	QTY.
1	CRANK ARM - LEFT	54014	1
2	CRANK ARM - RIGHT	54015	1
3	1"x1-1/8"x1/2" BEARING	44021	4
4	3/8"x15/32"x1/2" BEARING	44026	2

OTHER REFERENCE COMPONENTS

#	PART NAME	PART #	QTY.
5	RETAING RING - 25mm	43206	2
6	1"x1-3/8" WAVE SPR. WASHER	40004	1
7	PIVOT SHAFT	51068	1
8	1"x1/2"x.10 THR. WASHER	40031	4
9	.48"x.10" NYLON WASHER	43029	2
10	3/8"x3/4" CLEVIS SCREW	53016	2
11	5/16"-18 NYLOC NUT	42033	2
12	DRIVE CABLE	51045	2
13	CRANK ARM BUMPER	54002	2

7.2 Chain Lubrication

Remove the cover (see section 25). Use a throwaway rag to wipe the sludge from the chain. Apply a roller chain lubricant (example: CRC brand part number 03050) evenly and wipe the chain to remove the excess.



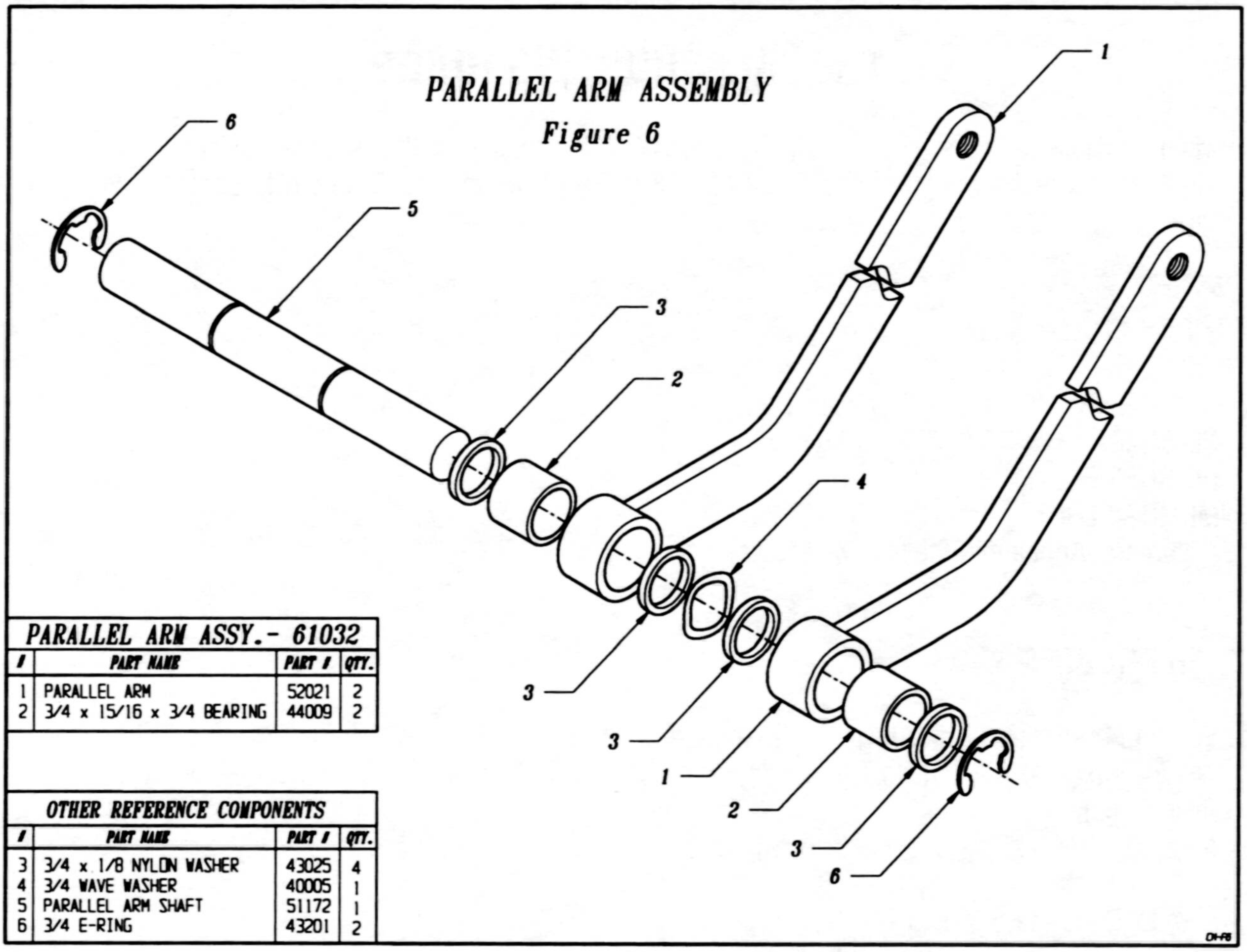
PEDAL ASSEMBLY
Figure 10

PEDAL ASSEMBLY - 61063

#	PART NAME	PART #	QTY.
1	PEDAL - MACH. & ANODIZED	52041	1
2	3/4 x 7/8 x 5/8 BEARING	44024	1
3	1/2 x 19/32 x 1/2 BEARING	44025	1
4	3/8 x 15/32 x 1/2 BEARING	44026	1
5	PEDAL BUMPER	54003	1

OTHER REFERENCE COMPONENTS

#	PART NAME	PART #	QTY.
6	3/8-16 HEX FLANGE NUT	42043	1
7	3/4 x 1-5/16 x .090 WASHER	43031	2
8	3/4 WAVE SPRING WASHER	40005	1
9	3/4 E-RING	43201	1
10	5/8-18 JAM NUT	42030	1
11	5/8 SERRATED LOCK WASHER	43028	1
12	RIGHT CRANK ARM - MACHINED	54015	1
13	3/8-18 x 1-1/8 BOLT	41043	1
14	3/8 CURVED SPRING WASHER	40002	1
15	3/8 OILITE BRONZE WASHER	44027	1
16	PEDAL SHAFT	51048	1
17	PARALLEL ARM	52021	1



PARALLEL ARM ASSEMBLY

Figure 6

PARALLEL ARM ASSY.- 61032

#	PART NAME	PART #	QTY.
1	PARALLEL ARM	52021	2
2	3/4 x 15/16 x 3/4 BEARING	44009	2

OTHER REFERENCE COMPONENTS

#	PART NAME	PART #	QTY.
3	3/4 x 1/8 NYLON WASHER	43025	4
4	3/4 WAVE WASHER	40005	1
5	PARALLEL ARM SHAFT	51172	1
6	3/4 E-RING	43201	2

7.3 Crank Arm (see Fig. 9) & Parallel (see Fig. 6) Shafts Lubrication

Apply a few drops of light machine oil (example: 'TRI-FLO' or 3-in-1 oil) on the pedal bearing surfaces. Wipe off any excess so that it does not attract dirt.

At the base of each crank arm is a lubrication point. Apply three squirts of a polymer grease (example: Clenesco Polylube') to each crank arm lubrication point. Apply one small squirt between the two parallel arms.

8. Friction Belt Replacement / Switch Ends

The friction belt should be replaced when the speed control degrades (see sections 21 & 22). In many cases the belt can be reversed to extend its life because the major wear is at the end that attaches to the motor pulley. Inspect the flywheel surface and remove any flywheel deposits with Scotch Brite or sandpaper.

9. Pedal Bearing Inspection

Pedal / Parallel Arm Bearing - Fig. 10, Part # 4 & # 3

The 3/8" bearings should be checked annually or after 7 million feet and replaced if needed (see section 39).

TROUBLESHOOTING GUIDE

This guide will help to locate a problem in the *Climb***Max**. Troubleshooting is much easier with spare parts. We highly recommend the purchase of a Dealer Service Kit as this guide refers to spare parts in some sections.

DISPLAY ERRORS

10. CAN'T SLOW DOWN or CONTROL LOST
11. NO SLACK
12. NO BRAKE
13. MEMORY LOST
14. A Numeral Appears in the Interval Display

OTHER PROBLEMS

15. Some LED's (lights) Are Out On The Display And There Is No Beep When The Power Is Turned On
16. All LED's (lights) Are Out On The Display And There Is No Beep When The Power Is Turned On
17. Reset Problem
18. A Key On The Display Console Doesn't Work
19. Pedal Squeak
20. A Pedal Doesn't Return To The Top or A Pedal Won't Go Down
21. Speed Control Is Jerky Or Varies Speed
22. No Speed Control And No Error Message Is Displayed
23. The *Climb***Max** Won't Accelerate To Top Speed
24. Cannot Select Group Race

DISPLAY ERRORS

The first thing to do if you get a Display Error is to press CLEAR. Sometimes the errors 'CAN'T SLOW DOWN' or 'CONTROL LOST' may be displayed in conjunction with other errors such as `NO BRAKE' or `NO SLACK.' If this is the case, follow the 'CAN'T SLOW DOWN' or 'CONTROL LOST' error. The following is a list of things to check which can cause 'CAN'T SLOW DOWN' or 'CONTROL LOST':

10. 'CAN'T SLOW DOWN' or 'CONTROL LOST'

10.1 Friction Belt

Disconnect the power cord from the *Climb***Max** and remove the cover (see section 25). See if the friction belt has worn through or is disconnected. If this has happened see section 28, Friction Belt Replacement.

10.2 Electrical Cables

If the belt is ok, look for any loose connections or wires around the power board or motor assemblies.

10.3 Test Motor

Put the climber in the Test Mode (see section 3) and run the motor in both directions by using the arrow keys. If the motor is not running refer to section 10.5.

10.4 Motor Runs

If the motor runs, check that the motor shaft is not spinning inside the pulley on which the belt wraps and that the motor does not have a stripped gearbox. If the motor shaft is spinning inside the pulley, remove the motor assembly (see section 26) and tighten the set screws (see Fig. 5). Make sure that one of the set screws is on the flat portion of the shaft. To verify that the motor does not have a stripped gearbox, look at the armature shaft on the outside of the motor. If the armature shaft on the outside of the motor spins but the output shaft and belt pulley do not, the gearbox is stripped. Replace the motor assembly.

10.5 Motor Doesn't Run

Unplug the motor cable from the power board assembly (see Fig. 16). Plug in the spare motor assembly and see if it will run in both directions. If the spare motor assembly runs, replace the original motor assembly. If you do not have a spare motor assembly, use an analog (not digital) meter (observe polarity!) to verify voltage at connector J5 on the power board. (see Fig. 16). Place the climber in the Test Mode (see section 3). Measure the voltage across the two pins of J5 while an assistant presses the up & down arrow keys on the console. J5 voltage with no load should read approximately 13 to 14 volts DC. If you do read the expected voltage, replace the motor assy. If the voltage is incorrect replace each of these parts in the following order: 1. power board assembly (see section 29), 2. display ribbon cable (see section 31), 3. display board (see section 30).

'NO SLACK' & 'NO BRAKE' ERRORS

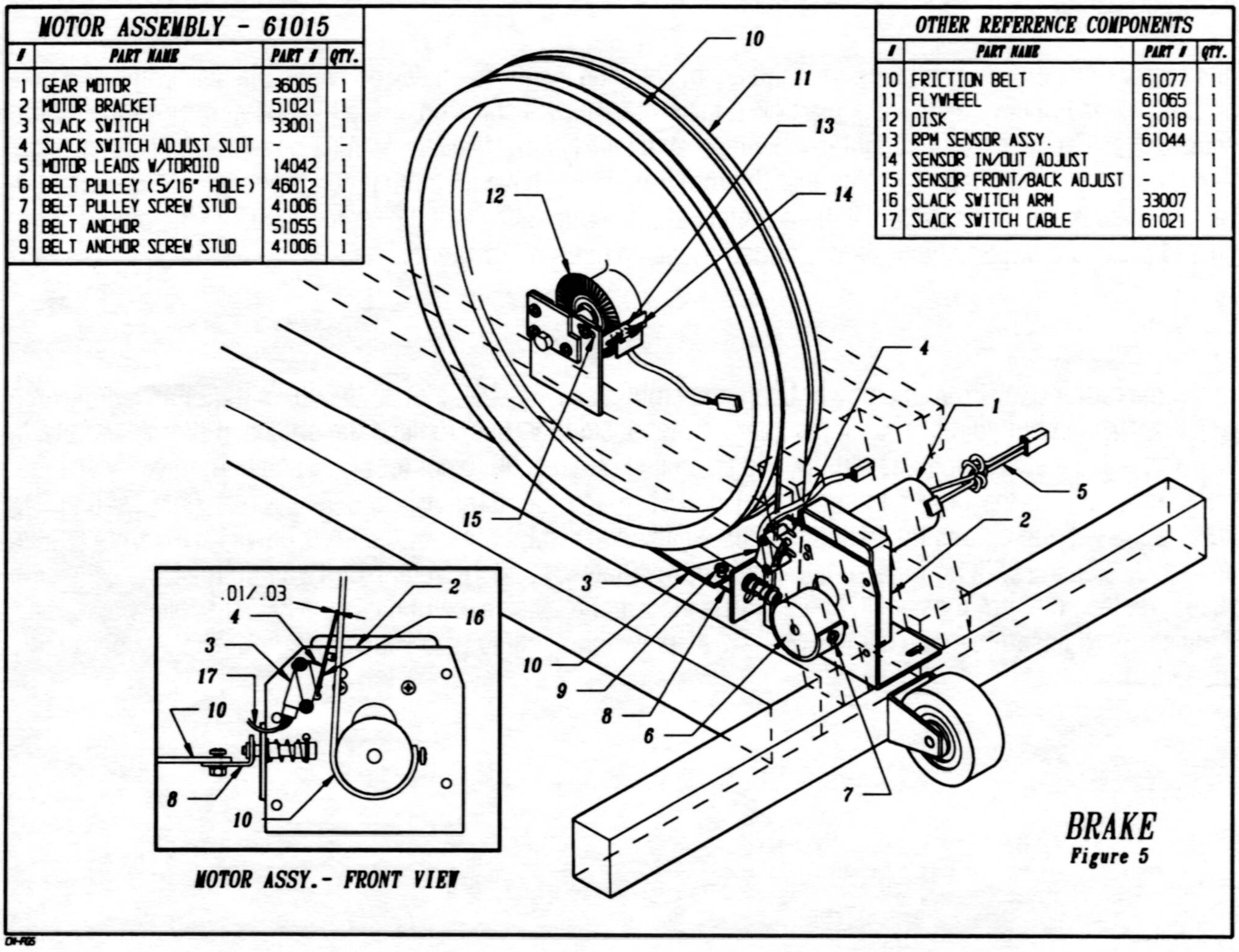
'NO SLACK' & 'NO BRAKE' refers to the slack switch located on the motor assembly (see Fig. 5). The purpose of the slack switch is to tell the microprocessor (located on the display board) whether the belt is loose or tight on the flywheel. When the *Climb***Max** is turned on or after someone stops climbing the microprocessor uses the slack switch to initialize the belt position. The following is the initialization process:

MOTOR ASSEMBLY - 61015

#	PART NAME	PART #	QTY.
1	GEAR MOTOR	36005	1
2	MOTOR BRACKET	51021	1
3	SLACK SWITCH	33001	1
4	SLACK SWITCH ADJUST SLOT	-	-
5	MOTOR LEADS W/TOROID	14042	1
6	BELT PULLEY (5/16" HOLE)	46012	1
7	BELT PULLEY SCREW STUD	41006	1
8	BELT ANCHOR	51055	1
9	BELT ANCHOR SCREW STUD	41006	1

OTHER REFERENCE COMPONENTS

#	PART NAME	PART #	QTY.
10	FRICTION BELT	61077	1
11	FLYWHEEL	61065	1
12	DISK	51018	1
13	RPM SENSOR ASSY.	61044	1
14	SENSOR IN/OUT ADJUST	-	1
15	SENSOR FRONT/BACK ADJUST	-	1
16	SLACK SWITCH ARM	33007	1
17	SLACK SWITCH CABLE	61021	1



BRAKE
Figure 5

The microprocessor checks the status of the slack switch. If the belt is pressed upon the slack switch arm, the motor will loosen the belt. If after 1.5 seconds the slack switch is not deactivated the display will show a 'NO SLACK' error. If the belt is not pressed upon the slack switch arm, the microprocessor then commands the motor to run slowly in the belt tightening direction until the belt presses the slack switch arm. If after 12 seconds the slack switch is not activated the display will show a 'NO BRAKE' error. Once the microprocessor gets the signal from the slack switch that the belt has pressed it (the belt is tight), the microprocessor runs the motor fast in the belt loosening direction until the belt is off the slack switch (this is the loose point). If after 1.5 seconds the slack switch is not deactivated the display will show a 'NO SLACK' error. No error will occur if you start climbing prior to initialization being completed.

11. 'NO SLACK"

11.1 Test Motor

Remove the cover (see section 25). Put the climber in the Test Mode (see section 3) and run the motor in both directions by using the arrow keys. If the motor is not running refer to section 10.5.

11.2 Test Slack Switch

Place the *Climb***Max** in Test Mode (see section 3). Watch the 'CALORIES' LED on the display board while pressing the slack switch on the motor assembly. The 'CALORIES' LED should be ON when the slack switch is NOT pressed, and the 'CALORIES' LED should go OFF when the slack switch is pressed. Pre-serial number 166190 *Climb***Max**es (Model 150) require an assistant to observe the 'CALORIES' LED while you press the slack switch. Current models emit an audible tone in response to the slack switch. (A status indicator also displays 'SLACK' or 'TIGHT' on the readouts). If the climber passes the slack switch test, but displays a 'NO SLACK' error, the slack switch may be out of adjustment. Refer to section 27 for slack switch adjustment procedure.

11.3 Bad Slack Switch

If the 'CALORIES' LED (or audible tone) does not respond to the slack switch as described above, turn the climber off. Disconnect the slack switch cable from the power board assembly (see Fig. 16). Plug the slack switch cable of the spare motor assembly into the power board without mounting the spare motor assembly and repeat the test. If the climber now passes the slack switch test, replace the slack switch and slack switch cable. Otherwise, plug the original slack switch back in and replace the following parts in this order: 1. display ribbon cable (see section 31) 2. power board assembly (see section 29), 3. display board (see section 30).

12. 'NO BRAKE'

12.1 Belt

Remove the cover (see section 25). See if the friction belt has worn through or is disconnected. If this has happened see section 28, Friction Belt Replacement.

12.2 Test Motor

Put the climber in the Test Mode (see section 3) and run the motor in both directions by using the arrow keys. If the motor is not running refer to section 10.5.

12.3 Test Slack Switch

Test the slack switch as described in section 11.2. If the climber passes the slack switch test, but displays a 'NO BRAKE' error, the slack switch may be out of adjustment. Refer to section 27 for slack switch adjustment procedure.

12.4 Slack Belt Test

If the motor is running and the slack switch is adjusted properly (see section 11.2) turn the *Climb***Max** off and on. Start climbing to 100 ft/min and stop. Watch the belt as the flywheel slows. If the motor assembly unwinds an excessive amount of belt, check for friction belt wear and belt residue on the flywheel surface. If there is considerable wear and residue, replace or flip the belt end for end and use Scotch Brite or sandpaper to remove the residue. If the motor passes the motor test (see section 10.4 and 12.2) and all prior tests have been completed but the motor still gives a poor response in operation, replace the motor assembly.

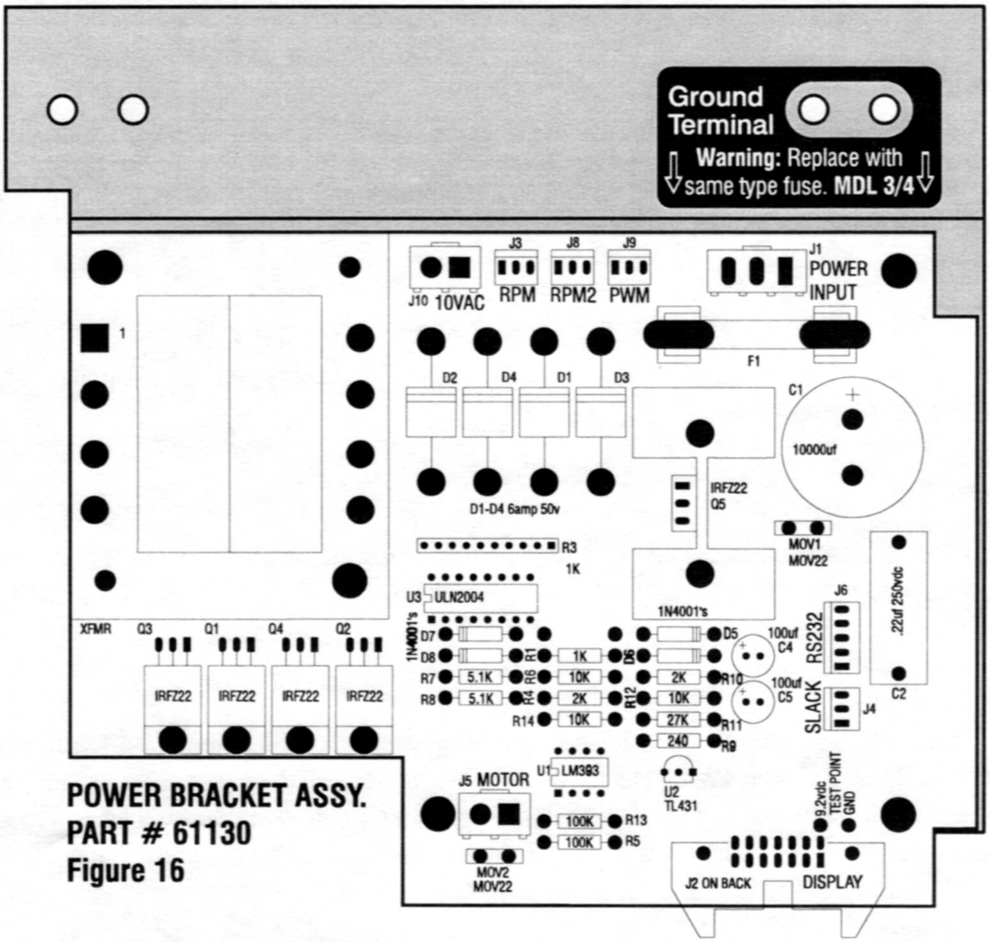
13. 'MEMORY LOST'

13.1 The contents of the permanent memory have been lost. If this occurs, Setup mode is automatically selected. The Odometer and Use Count are set to zero, the user/club program is cleared, and program time defaults to twenty minutes.

13.2 The permanent memory in the *Climb***Max** should be able to retain its contents for at least ten years. If this error consistently occurs before that time, you may consider replacement of the display board.

14. A Numeral Appears in the Interval Display

14.1 This indicates a problem with the display electronics. Sometimes it can be generated by turning the climber off and on too quickly; it may also occur in response to an irregularity in the electrical power (such as a surge or a brownout). This can be considered normal, and the display can be reset by slowly turning the power off then on again. Use your spare motor assembly to test the climber. The motor assembly may be using too much power. If you do not have a spare motor assembly, put the climber in Test Mode (see section 3). Press and hold the down arrow key. Keep pressing the down arrow key even after the motor assembly has tightened the belt as far as possible. If the display resets (all LEDs go off then on) at this time, the motor assembly may be causing the problem and should be replaced. If the motor assembly does not resolve the problem and the number persists or if it appears while the *Climb***Max** is in operation, the display board may need replacement (see section 30). If replacement of the display board does not resolve the problem, replace and test the following parts in this order: 1. power board assembly (see section 29) 2. display ribbon cable (see section 31) 3. display board (see section 30)


Ground Terminal
Warning: Replace with same type fuse. MDL 3/4
1
XFMR
Q3
Q1
Q4
Q2
IRFZ22
IRFZ22
IRFZ22
IRFZ22
J3
J8
J9
J10 10VAC
RPM
RPM2
PWM
J1 POWER INPUT
F1
D2
D4
D1
D3
C1
10000uf
D1-D4 6amp 50v
IRFZ22 Q5
R3
1K
MOV1 MOV22
U3 ULN2004
1N4001's
1N4001's
J6
.22uf 250vdc
D7
D8
R7
R8
5.1K
5.1K
R1
R6
R4
1K
10K
2K
R14
10K
D6
R12
D5
2K
10K
27K
240
R10
R11
R9
100uf C4
100uf C5
RS232
SLACK
J4
C2
J5 MOTOR
U1 LM393
U2 TL431
9.2vdc
TEST POINT
GND
100K
100K
R13
R5
MOV2 MOV22
J2 ON BACK
DISPLAY

POWER BRACKET ASSY.
PART # 61130
Figure 16

OTHER PROBLEMS

15. Some LED's (lights) Are Out On The Display And There Is A Beep When The Power Is Turned On

Power up in the Test Mode (see section 3) to check for LED's out. Replace the display board (see section 30) if there are some LED's out.

16. All LED's (lights) Are Out On The Display And There Is No Beep When The Power Is Turned On

16.1 Blown Fuse

Remove the cover (see section 25) and check the fuse (110VAC - MDL 3/4A 250V, or 220V - MDL 1/2A 250V) located on the power board (see Fig. 16). Check the fuse for zero ohms (good) using a volt ohm meter (a visual check is not reliable). Usually a fuse doesn't blow for no reason so it may blow again (because it is a slow blow fuse it may take up to a minute to blow). If it does, replace the fuse and unplug all of the connectors except J1 (see Fig. 16). If it blows again, replace the power board assembly. If it doesn't blow, plug each connector back in one at a time to find the part that is causing the fuse to blow. Replace that part.

16.2 Power Switch Test

Check that all wires are intact on the switch plate and power board. Using the volt ohm meter, check that the power switch is supplying 110 volts AC to the power board. Place the meter probes on the black and white wires on top of the power switch (switch on and power cord plugged in). **CAUTION:** Care is required when reading high voltage. Do not touch the two leads of the volt ohm meter together during the test as this can create a short. If no AC voltage is present at the power switch try a different power cord. Make sure that 110 VAC is present at the wall outlet. If there is still no power, replace the switch plate assembly (see section 33).

16.3 Power Board Test (see Fig. 16 & 17)

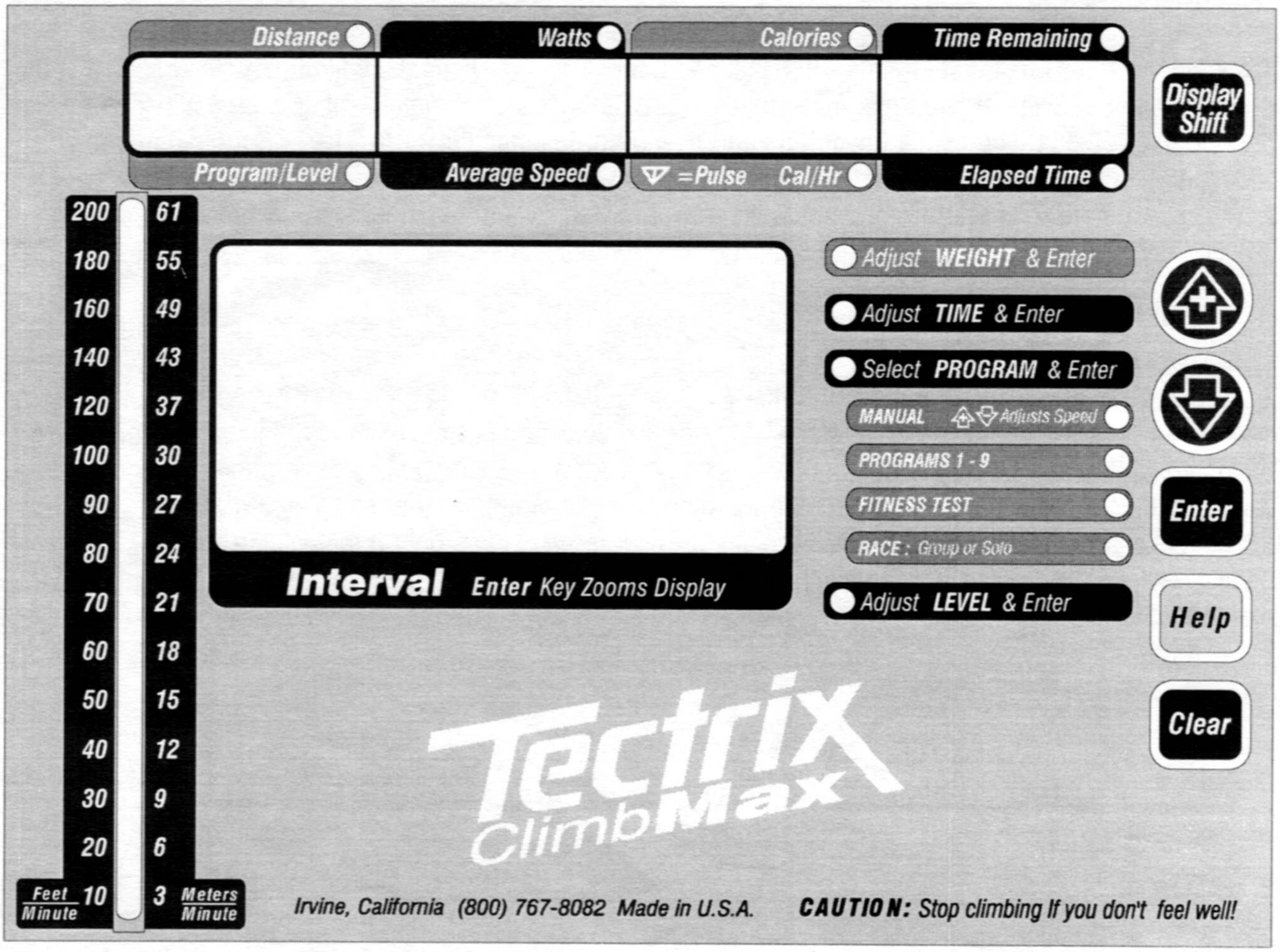
Check that there is 9.2 +/-.2 volts DC at the test points (labeled '9.2 VDC' and 'GND') located in the right bottom corner of the board (older versions of the power board do not have the test points, voltage may be tested at pin 14 on the display connector (J2) using pin 1 (or the square pad) as the ground reference). If the voltage reading is less than 9 volts, unplug the display ribbon cable at the power board (J2) and read the voltage again. If it is still less than 9 volts, replace the power board assembly. If the voltage is correct, replace and test each of these parts in the following order: 1. display ribbon cable (see section 31), 2. display board (see section 30).

17. Reset Problem

If the display doesn't light when you first switch power on, try switching power off and on slowly several times. The microprocessor (located on the display board) may have had a bad reset and hung up. A bad motor assembly may cause apparent display symptoms. Examples include:

1 Intermittent reset
2. Oscillating reset
3. Temporarily display LED's (lights) go out

Such motors may pass the motor power test and provide acceptable speed regulation. Use your spare motor assembly to test the climber. If you do not have a spare motor assembly, put the climber in Test Mode (see section 3). Press and hold the down arrow key. Keep pressing the down arrow key even after the motor assembly has tightened the belt as far as possible. If the display resets (all LEDs go off and the sign-on prompt is displayed) at this time, the motor assembly may be causing the problem and should be replaced. Even though the motor assembly passes this test , it could be the source of the problem and should be replaced. If the motor assembly does not resolve the problem replace and test the following parts in this order: 1. power board assembly (see section 29) 2. display ribbon cable (see section 31) 3. display board (see section 30)


Distance
Watts
Calories
Time Remaining
Display Shift
Program/Level
Average Speed
▽ =Pulse Cal/Hr
Elapsed Time
200
180
160
140
120
100
90
80
70
60
50
40
30
20
10
Feet Minute
61
55
49
43
37
30
27
24
21
18
15
12
9
6
3
Meters Minute
Adjust WEIGHT & Enter
Adjust TIME & Enter
Select PROGRAM & Enter
MANUAL Adjusts Speed
PROGRAMS 1 - 9
FITNESS TEST
RACE: Group or Solo
Adjust LEVEL & Enter
Interval Enter Key Zooms Display
Enter
Help
Clear
Tectrix ClimbMax
Irvine, California (800) 767-8082 Made in U.S.A.
CAUTION: Stop climbing If you don't feel well!

18. A Key On The Display Console Doesn't Work

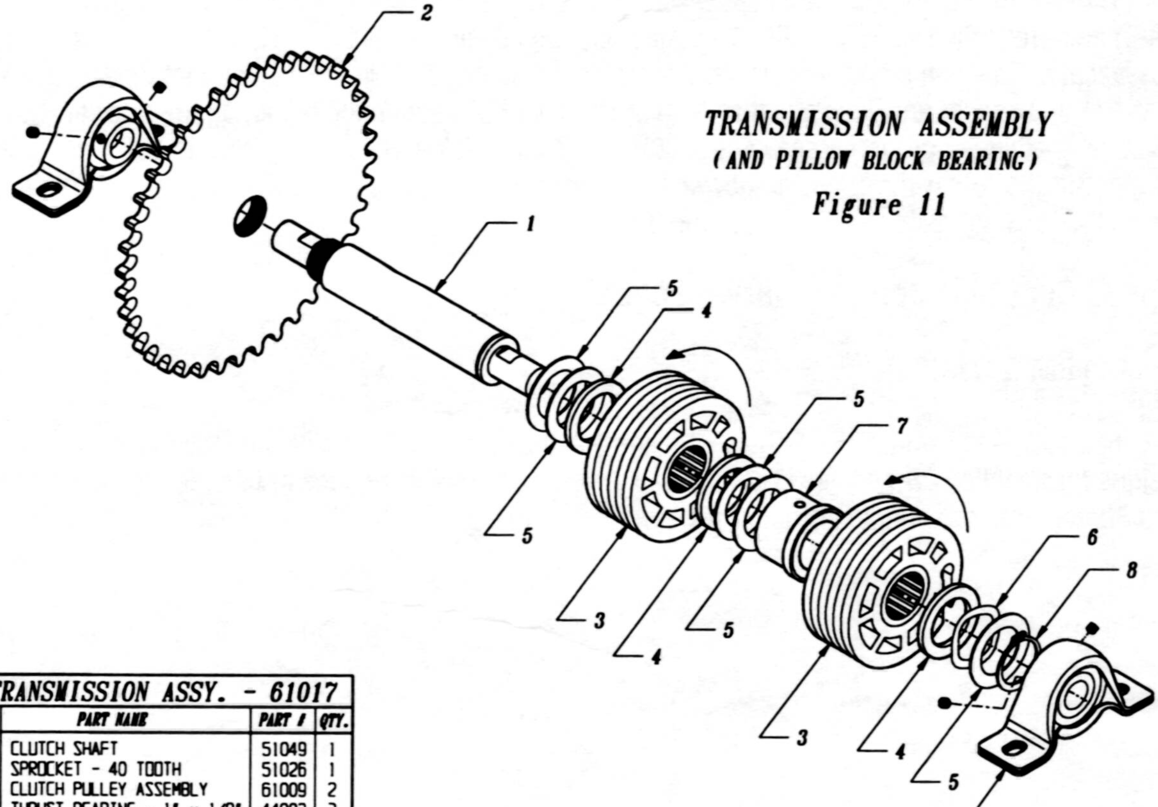
While in normal operating mode, test the keys by pressing them. If a key is good, the display will beep when the key is pressed. To test the keypad for shorted keys, put the climber in Test Mode (see section 3). Press each key individually. Each key will have its own distinctive beep. If one or more keys do not work or if two keys have the same pitch (the keys are shorted together), substitute a known good key panel overlay and test. If they still do not work, replace the display board (see section 30).

19. Pedal Squeak

A squeak in the pedal generally means that one of the sleeve bearings in the pedal, crank arm or parallel arm has become dry. Since it is almost impossible to determine which bearing is squeaking, it is best to lube them all (see section 6 & 7).

20. A Pedal Doesn't Return To The Top or A Pedal Won't Go Down

Remove the cover (see section 25) and inspect the chain (verify there are no foreign objects in the chain), springs and cables (see section 34 and Fig. 7). Check that the clutch pulley will freewheel (see Fig. 11).



TRANSMISSION ASSEMBLY
(AND PILLOW BLOCK BEARING)
Figure 11

PILLOW BLOCK BEARING
P/N 44014 (REF) 2 PLCS
NOTE: NOT INCLUDED IN ASSY. 61017

TRANSMISSION ASSY. - 61017

#	PART NAME	PART #	QTY.
1	CLUTCH SHAFT	51049	1
2	SPROCKET - 40 TOOTH	51026	1
3	CLUTCH PULLEY ASSEMBLY	61009	2
4	THRUST BEARING - 1" x 1/8"	44002	3
5	WASHER - 1" x 1/32"	44020	5
6	WAVE SPRING WASHER - 1"	40004	1
7	BEARING - 1" x 1" FLANGE	44031	1
8	RETAINING RING - 25mm	43206	1

CH-F11

21. No Speed Control And No Error Message Is Displayed

21.1 Description

If there is no pedal resistance and the speed display doesn't report climbing speed, the RPM sensor is not functioning or the signal is not reaching the display board. As you press the up arrow key in the manual mode a single flashing LED goes up and stays at the speed you have selected. This is the command speed LED. The LED's that fill in below the command LED are the actual speed indicators. If you start climbing after the command LED is set and the speed indicators don't light and speed is not controlled, then the microprocessor does not see the RPM signal. **Note:** Sometimes it is possible to get a 'NO SLACK' or 'NO BRAKE' error when climbing with this problem.

21.2 Primary RPM Test

Enter Test Mode (see section 3) and check the LED's next to "TIME REMAINING" and "ELAPSED TIME." When you step on the pedal they should flash on and off. This is the raw input from the RPM sensor. If those LED's are not flashing make sure that the RPM disk is turning and aligned with the RPM sensor (see section 32) then replace and test these parts in the following order (also see section 21.3): 1. RPM sensor (see section 32), 2. power board assembly (see section 29), 3. display ribbon cable (see section 31), 4. display board (see section 30).

21.3 Secondary RPM Test

The *Climb***Max** has an oscilloscope-like viewing function of the RPM output. Enter the Test Mode (see section 3) and press the DISPLAY SHIFT key. Step on a pedal and watch the INTERVAL display. It should fill up one level at a time as the flywheel slows. If there are holes or peaks in the display that repeat, check that the RPM disk and sensor are clean and that the disk is not wobbly, scratched or damaged. Also verify that the RPM Sensor is adjusted properly (see section 28). If both the disk and sensor appear to be all right, test by replacement in the following order: 1. power board assembly (see section 29), 2. display ribbon cable (see section 31), 3. display board (see section 30).

22. Speed Control Is Jerky Or Varies Speed

22.1 Friction Belt & Flywheel

Remove the cover (see section 25). Remove and inspect the friction belt for wear and the flywheel surface for belt residue (see section 28). If there is considerable wear and residue, replace or reverse the belt end for end and use Scotch Brite or sandpaper to remove the residue, then retest the *Climb***Max**.

22.2 Motor & Slack Switch

Remove the cover (see section 25) and place the *Climb***Max** in Test Mode (see section 3) and run the motor in both directions. Check for jerkiness or loading down of motor. If the motor doesn't run smoothly, replace the motor assembly. Check that the slack switch is adjusted properly (see section 27).

22.3 RPM Sensor
Test the climber as described in section 21.2. If the climber passes the test, proceed to section 21.3 for the next test.

23. The *Climb***Max** Won't Accelerate To Top Speed

23.1 Manual & Program Mode

The *Climb***Max** will never reach 200 ft/min in a program. This speed can only be reached in the manual mode or in a race. There is a minimum weight of 75 pounds required to accelerate to 200 ft/min. As you press the up arrow key in the manual mode, a single flashing LED shows the speed you have selected. This is the command speed LED. The LED's that fill in behind the command LED form a bar graph indicating actual speed. If the bar graph does not fill in behind the command LED then proceed.

23.2 Friction Belt & Flywheel

Check the friction belt and flywheel for wear and residue (see section 21.1).

23.3 Slack Switch

The slack switch must be adjusted correctly for full speed operation (see section 27). The slack switch may need to be adjusted closer to the friction belt so that it does not open during operation.

24. Cannot Select 'Group Race'

The communications link between the climbers is incomplete. All units must be turned on and connected to each other for the racing network to function (see section 1). If the communications aren't working the *Climb***Max** will display 'SOLO GOAL' instead of 'GROUP GOAL'. After a *Climb***Max** has been turned on it will look to see if it is in a group the first time the race function is invoked. If it comes up 'SOLO GOAL' it will not check for the group again until power has been cycled. When setting up the group for the first time it is best to turn off and on all the *Climb***Max**es in the group.

Please note that you cannot use standard telephone cables to connect climbers; the wiring is different, even though the connector is the same. However, you can use the kind of telephone extension cable that has a plug on one end and a socket on the other end if you want to link two distant climbers. Never connect a *Climb***Max** to a telephone outlet; doing so might damage both the climber and the telephones.

24.1 *Climb***Max** Communication Test

The *Climb***Max** Test Mode has a test which is useful in troubleshooting communications problems. There are two jacks on every climber, an IN jack and an OUT jack. There are two indicators on the display, the 'DISTANCE' indicator and the 'PROGRAM/LEVEL' indicator. The 'DISTANCE' indicator shows the state of the OUT jack (serial transmitter output) and the 'PROGRAM/LEVEL' shows the state of the IN jack (receiver input). If the 'DISTANCE' indicator is off, the test is not running (enabled). Press the 'DISPLAY SHIFT' key to start or stop the test. Make sure that the test is running, then, if the 'PROGRAM/LEVEL' indicator is on, the climber has passed the communication test. If the 'PROGRAM/LEVEL' indicator is off, then the climber has failed the communication test. The following chart displays the expected results of a good climber.

IN Jack	OUT Jack	Expected Results	
		'DISTANCE' Indicator	**'PROGRAM/LEVEL' Indicator**
COMMUNICATING			
Terminator Plug	Terminator Plug	Flicker	ON
Cable From OUT (loop to same Climber)	Cable From IN (loop to same Climber)	Flicker	ON
NOT COMMUNICATING			
Empty	Empty	Flicker	OFF
Terminator Plug	Empty	Flicker	OFF
Empty	Terminator Plug	Flicker	OFF

24.2 Linking Climbers Together (see section 1, Fig. 4)

If the cables are not routed correctly from climber to climber, the race option will not function properly. There are two jacks on every climber, an IN jack and an OUT jack. Verify that the climbers are linked to each other in the following manner. The first climber in the row should have a terminator plug in its IN jack. A cable should be connected from the first climber's OUT jack to the second climber's IN jack. A cable should be connected from the second climber's OUT jack to the third climber's IN jack and so forth until you reach the last climber. The last climber should have a terminator plug in its OUT jack.

24.3 Test Terminator Plugs And Cables

Refer to section 24.1 and test all terminators plugs and cables on a single climber. If no terminator plug or climber passes the communication test, the problem is probably with the climber. Try another climber. Replace any terminator plugs or cables that do not pass the test with a known good climber.

24.4 Test *Climb**Max***

Perform the communication test (see section 24.1) on each individual climber using two known good terminator plugs or a single cable.

If the climber does not pass the communication test, remove the cover (see section 25) and inspect the communication jack cable. Make sure that the communication jack cable is plugged into J6 on the power board assembly and no wires are visibly broken. If the connector has come unplugged, plug it in. Replace the communication jack cable (part number 14039) if the wires are broken. Pull on all of the wires with your fingers using moderate force to verify that the wire is securely crimped to the contact terminal. If the wire has become unplugged from the connector, plug it in. If the wires and connectors look fine, replace and test these parts in the following order: 1. display ribbon cable (see section 31), 2. power board assembly (see section 29), 3. display board (see section 30).

If any climber passes the communication test but will not 'GROUP RACE' when linked with other climbers, as verified in section 24.2, the IN and OUT jacks are probably reversed on one of the climbers. To verify which climber has the problem, link only two climbers together. If they both will 'GROUP RACE', add another climber to the group. If all three will 'GROUP RACE', add another climber to the group. Continue adding one climber to the group, until one climber, when added, will not 'GROUP RACE'. When a climber, when added to the group, will not 'GROUP RACE', proceed to next paragraph. If the original two climbers will not 'GROUP RACE', one of the climbers has a problem. We'll call the original two climbers, climber 1 and climber 2. Link climber 1 to a third climber (which we'll call climber 3). If climber 1 and climber 3 will 'GROUP RACE', then climber 2 has the problem. Proceed to next paragraph to troubleshoot climber 2. If climber 1 and climber 3 will not 'GROUP RACE', link climber 2 to climber 3. If climber 2 and climber 3 will 'GROUP RACE', then climber 1 has the problem. Proceed to next paragraph to troubleshoot climber 1.

Switch the position of the plugs in the two jacks of the climber. If the climber will now 'GROUP RACE', the two jacks are reversed internally. Remove the cover (see section 25). **Carefully** pry the retaining bezel loose from the jacks on the outside of the switchplate. **CAUTION: The retaining bezel will probably be damaged when removed and should be replaced.** Reverse the position of the two jacks in the switchplate, then reinstall the retaining bezels. The climbers should now 'GROUP RACE' when linked.

Part Replacement

The *Climb***Max** modular design allows for easy service. Each module or assembly can be replaced simply and quickly.

Recommended tools:

Set of Allen Hex Wrenches
Adjustable Jaw Wrench
Retaining Ring Pliers
Pliers
Small Flathead Screwdriver
#2 Phillips Screwdriver
Duct Tape
*120 Grit Sandpaper or Scotch Brite**
Volt Ohm Meter
Set of Nut Drivers

Major assemblies and procedures:

25. Cover
26. Motor Assembly
27. Slack Switch Adjustment
28. Friction Belt Replacement
29. Power Board Assembly
30. Display Console
31. Display Cable
32. RPM Assembly
33. Switch Plate Assembly
34. Spring / Drive Cable Replacement
35. Flywheel Assembly
36. Crank / Pedal Removal From Frame
37. Crank Arm Assembly
38. Parallel Arm Assembly
39. Pedal Assembly
40. Transmission Assembly

25. Cover

Tools: *#2 Phillips Screwdriver*

25.1 Cover Removal

Unplug the power cord and phone cables, then unscrew seven Phillips head screws (five in front, and two back by the pedals). Standing at the rear of the *Climb***Max**, grab each edge of the cover at the base and spread it gently apart, about 2" each side, while lifting up.

25.2 Cover Replacement

Standing in front of the *Climb***Max**, grab the two bottom edges of the cover and spread them while sliding it over the base. Take care that you don't snag any cables. After the cover is in place, plug in the power cord and turn the *Climb***Max** on. Try climbing to ensure that none of the cables have come off. If you get an error on the display, take off the cover and check all of the cables. Replace the Phillips screws.

26. Motor Assembly

Tools: *#2 Phillips Screwdriver*

26.1 Motor Assembly Removal (see Fig. 5)

Remove the cover (see section 25). Disconnect the motor cable and the slack switch cable (J4) from the power board assembly. Lay the *Climb***Max** on its right side. Remove the Friction Belt (see section 28). Unscrew the two #10-24 Phillips head screws which mount the motor assembly to the frame and remove the motor assembly.

26.2 Motor Assembly Replacement (see Fig. 5)

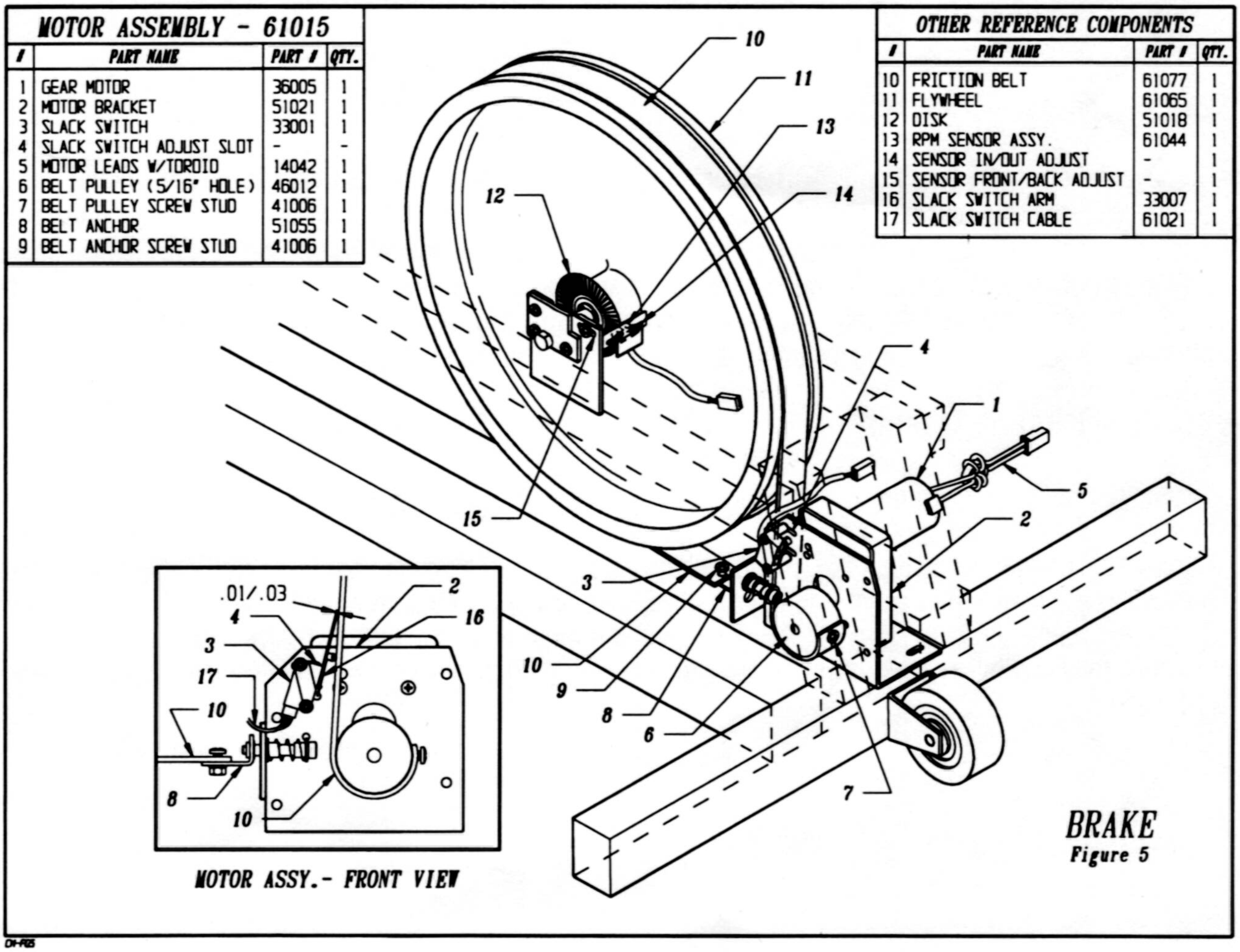
Replace the motor assembly in reverse order of removal, but do not tighten the screws. Replace the friction belt (see section 28) and adjust the motor assembly so that the friction belt is aligned with the flywheel. Tighten the screws. Reconnect the motor cable (J5) and the slack switch cable (J4) to the power board assembly.

MOTOR ASSEMBLY - 61015

#	PART NAME	PART #	QTY.
1	GEAR MOTOR	36005	1
2	MOTOR BRACKET	51021	1
3	SLACK SWITCH	33001	1
4	SLACK SWITCH ADJUST SLOT	-	-
5	MOTOR LEADS W/TOROID	14042	1
6	BELT PULLEY (5/16" HOLE)	46012	1
7	BELT PULLEY SCREW STUD	41006	1
8	BELT ANCHOR	51055	1
9	BELT ANCHOR SCREW STUD	41006	1

OTHER REFERENCE COMPONENTS

#	PART NAME	PART #	QTY.
10	FRICTION BELT	61077	1
11	FLYWHEEL	61065	1
12	DISK	51018	1
13	RPM SENSOR ASSY.	61044	1
14	SENSOR IN/OUT ADJUST	-	1
15	SENSOR FRONT/BACK ADJUST	-	1
16	SLACK SWITCH ARM	33007	1
17	SLACK SWITCH CABLE	61021	1



MOTOR ASSY.- FRONT VIEW

BRAKE
Figure 5

27. Slack Switch Adjustment (see Fig. 5)

Tools: *Small Flathead Screwdriver*

The slack switch is located on the motor assembly and is accessible from the motor side of the *Climb***Max**. Remove the cover (see section 25). Inspect the slack switch arm to ensure that it is not bent. There are two screws that hold the slack switch in place. The top screw slides through an adjustment slot and the other is fixed. Loosen both screws (there is a nut on the other side that you can hold with your fingertip) until the slack switch is free to slide. Turn the shaft on the end of the motor to tighten the friction belt on to the flywheel until the anchor spring is fully compressed. Adjust the slack switch so that the arm roller is pressing against the friction belt and there is .01" to .03" clearance between the switch body and the arm. Tighten the screws.

Test the adjustment by turning on the power switch and observing the friction belt initialization process. The motor will tighten the belt until it activates the slack switch, then will back off slightly. This process should be completed without any error messages appearing on the display. Observe the belt anchor spring. The spring should not be compressed in the slack state. If it is compressed, adjust the slack switch towards the belt and test again. The second test is to start climbing. When you first step on the pedal the belt should engage smoothly. Pedal at a high speed. If the pedal accelerates to a high rate and then the belt grabs abruptly, there is too much slack in the belt. Adjust the slack switch away from the belt and test again.

28. Friction Belt Replacement (see Fig. 5)

Tools: *#2 Phillips Screwdriver*
*120 Grit Sandpaper or Scotch Brite**

28.1 Friction Belt Replacement

Remove the cover (see section 25). The belt is removed from the motor assembly at the belt anchor and the belt pulley. After the belt is removed check the flywheel surface for any foreign materials. Use sandpaper or Scotch Brite to remove any belt residue on the flywheel belt surface. Install the belt with the felt side in contact with the flywheel and the woven side up. The belt is symmetrical end for end and either end may be fastened to the anchor. Install the belt while checking that it is properly aligned. Routing is from the belt anchor, around the flywheel, between the slack switch and the belt pulley and then connected to the belt pulley.

29. Power Board Assembly

Tools: *#2 Phillips Screwdriver*

Remove the cover (see section 25). Unplug all the cables from the power board (remember the display cable underneath). There is no need to mark the cables; they will only fit their proper connectors. J1/Power input, J2/Display cable, J3/RPM cable, J4/Slack switch, J5/Motor assembly and J6/RS232 cable (see Fig. 16). Unscrew the two Phillips screws and remove the assembly. To reassemble, follow the instructions in reverse order.

30. Display Console

Tools: *#2 Phillips Screwdriver*
5/16" Nut Driver
Small Flathead Screwdriver

30.1 Display Board Replacement

Remove the four #6-32 Phillips screws in the corners on the back side of the display console. Carefully tap the top edge of the console with the palm of your hand until it is free. Disconnect the display ribbon and heart rate monitor (optional) cables and lay the display console on a soft surface that won't scratch the overlay. Remove the four #6-32 plastic nuts. Remove the keypad ribbon connector. **CAUTION:** The display board is sensitive to static electricity. Before handling the display board, touch something that is grounded to discharge yourself. Do not lay the board on plastic materials unless they are static safe (wood, paper, cotton, metal and the pink or blue plastic bag in which the board was shipped are OK). To replace the display board follow the instructions in reverse order.

30.2 EPROM Replacement

Locate the EPROM chip on the display board (it is the only chip that is socketed). **CAUTION:** The EPROM is sensitive to static electricity. Before handling the EPROM, touch something that is grounded to discharge yourself. Do not lay the EPROM on plastic materials unless they are static safe (wood, paper, cotton & metal are ok). Remove the old EPROM by sliding the flathead screwdriver between the EPROM and the socket. Slowly pry it up by carefully twisting the screwdriver. Be careful not to bend the legs. **Note:** The EPROM has a notch on one end and the new EPROM should be inserted in the same direction. Set the new EPROM on the socket and check that the legs line up. Using even pressure, insert the EPROM into the socket. Check that all of the legs are inserted and none are bent.

30.3 Display Overlay Replacement, Part # 51913

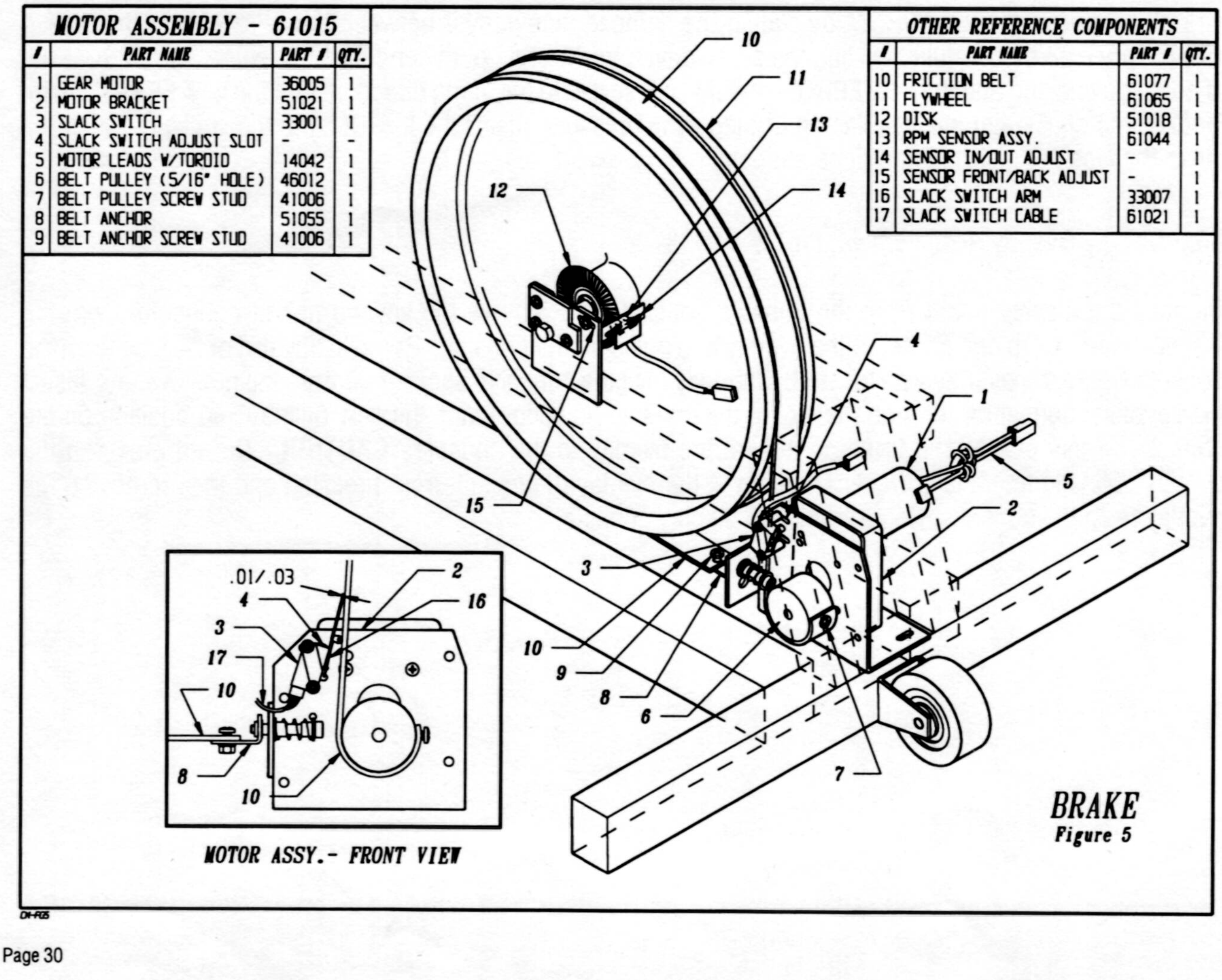
Remove the display board from the console housing, and remove the keypad ribbon connector from the display board. Grab one corner of the overlay and pull it off the console. Remove any dirt or residue from the console where the overlay was located. Carefully peel the adhesive backing off from the new overlay. Insert the keypanel connector through the slot in the console housing. Place the new overlay into position on the console. Press evenly and firmly to adhere the overlay to the console. **CAUTION:** Do not press on the overlay until alignment is correct. Damage to the overlay may result from pressing and then removing the overlay from the console. Reassemble the display console.

31. Display Cable, Part # 61059

Tools: #2 Phillips Screwdriver
5/16" Nut Driver
Small Flathead Screwdriver

31.1 Test With a Spare Cable

Before you change a display cable, be sure to test it first to determine that the old one is bad. Remove the display console (see section 30). Lay the *Climb***Max** on its side and disconnect the display cable from the power board. Plug your spare cable into the power board and stand the *Climb***Max** up. Plug the cable into the display console and set it on the floor. Run your tests and see if the new cable cures the problem.



MOTOR ASSEMBLY - 61015

#	PART NAME	PART #	QTY.
1	GEAR MOTOR	36005	1
2	MOTOR BRACKET	51021	1
3	SLACK SWITCH	33001	1
4	SLACK SWITCH ADJUST SLOT	-	-
5	MOTOR LEADS W/TOROID	14042	1
6	BELT PULLEY (5/16" HOLE)	46012	1
7	BELT PULLEY SCREW STUD	41006	1
8	BELT ANCHOR	51055	1
9	BELT ANCHOR SCREW STUD	41006	1

OTHER REFERENCE COMPONENTS

#	PART NAME	PART #	QTY.
10	FRICTION BELT	61077	1
11	FLYWHEEL	61065	1
12	DISK	51018	1
13	RPM SENSOR ASSY.	61044	1
14	SENSOR IN/OUT ADJUST	-	1
15	SENSOR FRONT/BACK ADJUST	-	1
16	SLACK SWITCH ARM	33007	1
17	SLACK SWITCH CABLE	61021	1

BRAKE
Figure 5

31.2 Display Cable Removal

Remove the display console (see section 30). Unplug the display cable from the power board assembly. Remove the handrails and display upright (see section 1). Unclamp the display cable at each end. Slide the connector through the hole in the console back-plate and pull the cable out from the bottom.

31.3 Display Cable Replacement

Slide the cable through the hole in the console back-plate. Stand the display upright up and let gravity help feed the cable. Clamp the display cable at the bottom with 6" of cable extending out. Pull the cable taut inside the upright and clamp the display cable at the display board end. **CAUTION:** Do not lean the upright tube on its end which can cut the new display cable. Replace the display upright and handrails (see section 1) and plug the cable into the power board. Replace the display console (see section 30), plug in the power cord and test.

32. RPM Assembly (see Fig. 5)

Tools: *Small Flathead Screwdriver*
#2 Phillips Screwdriver

Remove the cover (see section 25). Unplug the RPM sensor cable from the power board. Use your flathead screwdriver to remove the two screws, nuts and spacers holding the sensor in place (see Fig. 5). Replace the same way that you removed the sensor. Adjust so that the RPM disk is centered in the 'U' of the sensor and is as deep as possible without touching the disk. Make sure that the disk does not touch the sensor at any point when the flywheel rotates.

33. Switch Plate Assembly

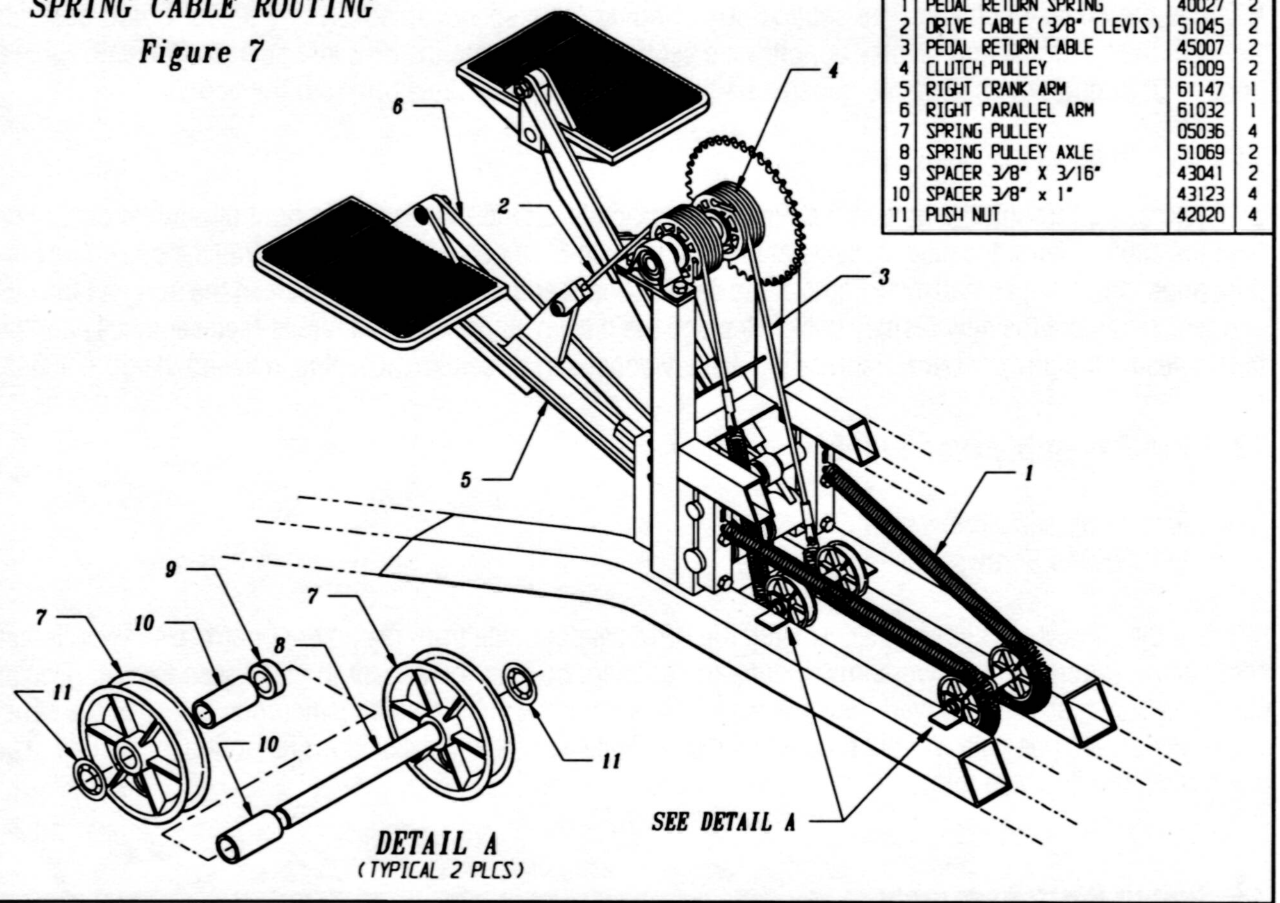
Tools: #2 Phillips Screwdriver

Remove the cover (see section 25). Unplug the AC IN, ground and the RS - 232 connector from the power board assembly (part number 61016). Unscrew the two phillips screws and remove the assembly.

To replace the assembly, follow the instructions in reverse order, taking care that the front of the switch plate lines up with the front of the frame.

SPRING CABLE ROUTING

Figure 7



SPRING CABLE ROUTING			
#	PART NAME	PART #	QTY.
1	PEDAL RETURN SPRING	40027	2
2	DRIVE CABLE (3/8" CLEVIS)	51045	2
3	PEDAL RETURN CABLE	45007	2
4	CLUTCH PULLEY	61009	2
5	RIGHT CRANK ARM	61147	1
6	RIGHT PARALLEL ARM	61032	1
7	SPRING PULLEY	05036	4
8	SPRING PULLEY AXLE	51069	2
9	SPACER 3/8" X 3/16"	43041	2
10	SPACER 3/8" x 1"	43123	4
11	PUSH NUT	42020	4

34. Spring / Drive Cable Replacement

Tools: *Adjustable Jaw Wrench*
3/16" Allen Hex Wrench
#2 Phillips Screwdriver

34.1 Spring Replacement

Remove the cover (see section 25). Tighten the friction belt on the flywheel by turning the shaft on the end of the motor (see Fig. 5) to keep the flywheel from turning.

To remove an intact spring, pull up on the pedal return cable and release the ball from the clutch pulley (see Fig. 7). Remove the cable and pedal return spring.

Slide the new spring around the pulley closest to the motor and hook the top end to the frame (see Fig. 7). Slip the pedal return cable under the pulley closest to the pedals and hook it into the free end of the spring. Pull the cable up and insert the ball into the clutch pulley. Check that the spring is routed properly. Plug the power cord in and try climbing.

34.2 Drive Cable Removal

Remove the cover (see section 25). Pull up on the pedal return cable and release the ball from the clutch pulley (see Fig. 7). Remove the 5/16"-18 nut and shoulder screw from the clevis (see Fig. 9).

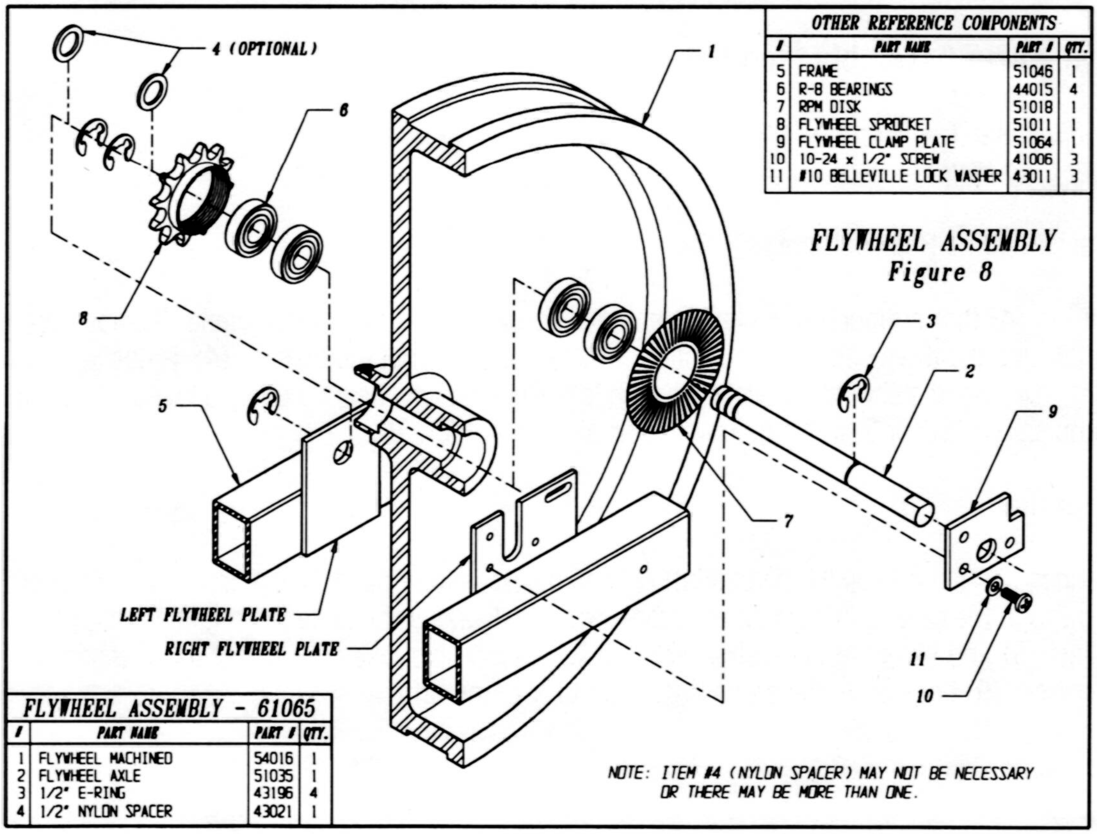
34.3 Drive Cable Replacement

Check the wear on the clevis bearing and shoulder bolt and replace if necessary (see section 37). Grease the bearing and attach the new drive cable using the shoulder bolt and nut (note that one side of the clevis has a "D" hole and the shoulder bolt has a machined surface that matches it). Verify that the clevis can swivel freely on the crank arm. Tighten the friction belt on the flywheel by turning the shaft on the end of the motor (see Fig. 5) to keep the flywheel from turning. Insert the ball of the drive cable into the slot in the clutch pulley and wind up the cable, pulling the crank arm to the top. Pull the pedal return cable up and insert the ball into the clutch pulley. Plug the power cord in and try climbing, checking that the system is running smoothly.

35. Flywheel Assembly

Tools: *Small Flathead Screwdriver*
#2 Phillips Screwdriver

Remove the cover (see section 25). Remove the friction belt (see section 28). Remove the RPM sensor by removing the front/back adjust screw (see Fig. 5). Remove the three Phillips screws and the flywheel clamp plate (see Fig. 8). Using the flathead screwdriver, pry off the E-ring on the **sprocket end** of the shaft. Slide the flywheel towards the RPM side until the flywheel axle is free. You may need to tilt the flywheel and "walk" the flywheel over to clear the spring pulley. Lift the flywheel up and remove the chain from the sprocket. Replace the flywheel following the instructions in the reverse order. **Note:** Align the shaft to the 'D' shape of the flywheel clamp plate prior to installing the E-ring.



OTHER REFERENCE COMPONENTS			
#	PART NAME	PART #	QTY.
5	FRAME	51046	1
6	R-8 BEARINGS	44015	4
7	RPM DISK	51018	1
8	FLYWHEEL SPROCKET	51011	1
9	FLYWHEEL CLAMP PLATE	51064	1
10	10-24 x 1/2" SCREW	41006	3
11	#10 BELLEVILLE LOCK WASHER	43011	3

FLYWHEEL ASSEMBLY
Figure 8

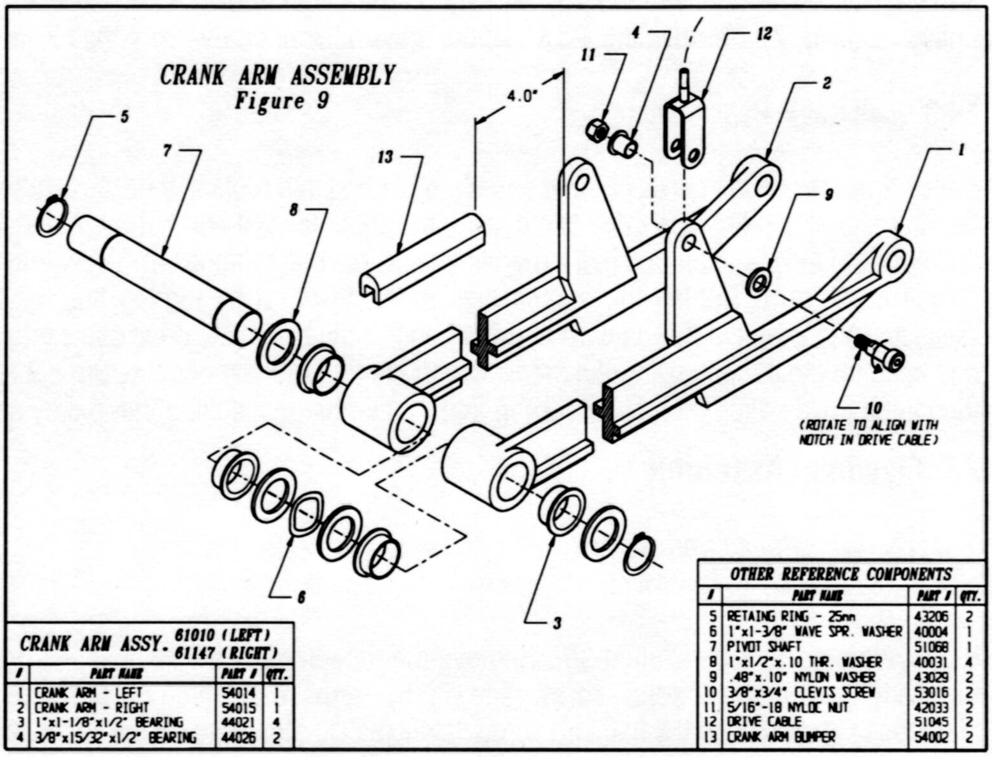
FLYWHEEL ASSEMBLY - 61065			
#	PART NAME	PART #	QTY.
1	FLYWHEEL MACHINED	54016	1
2	FLYWHEEL AXLE	51035	1
3	1/2" E-RING	43196	4
4	1/2" NYLON SPACER	43021	1

NOTE: ITEM #4 (NYLON SPACER) MAY NOT BE NECESSARY OR THERE MAY BE MORE THAN ONE.

36. Crank / Pedal Removal From Frame

Tools:
Adjustable Jaw Wrench
3/16" Hex (Allen) Wrench
(for older models)

Remove the cover (see section 25). Remove the drive cables (see section 34). Remove the clamps that hold the pivot shaft and parallel arm shaft. Remove the entire crank, parallel arm and pedal assembly by twisting it 90 degrees and pulling out.


CRANK ARM ASSEMBLY
Figure 9

CRANK ARM ASSY. 61010 (LEFT) 61147 (RIGHT)

#	PART NAME	PART #	QTY.
1	CRANK ARM - LEFT	54014	1
2	CRANK ARM - RIGHT	54015	1
3	1"x1-1/8"x1/2" BEARING	44021	4
4	3/8"x15/32"x1/2" BEARING	44026	2

OTHER REFERENCE COMPONENTS

#	PART NAME	PART #	QTY.
5	RETAING RING - 25mm	43206	2
6	1"x1-3/8" WAVE SPR. WASHER	40004	1
7	PIVOT SHAFT	51068	1
8	1"x1/2"x.10 THR. WASHER	40031	4
9	.48"x.10" NYLON WASHER	43029	2
10	3/8"x3/4" CLEVIS SCREW	53016	2
11	5/16"-18 NYLOC NUT	42033	2
12	DRIVE CABLE	51045	2
13	CRANK ARM BUMPER	54002	2

To replace this assembly insert the shafts into their respective clamps but don't tighten them down yet. Install the drive cables (see section 34). Slide the pivot shaft in the clamps to line up the cable with the clutch pulleys then tighten the clamps on the pivot shaft. Slide the parallel arm shaft in or out to center the parallel arms between the pedals and then tighten the clamps. Plug the power cord in and try climbing.

37. Crank Arm Assembly (see Fig. 9)

Tools: *Adjustable Jaw Wrench*
Retaining Ring Pliers

37.1 Clevis Bearing Replacement

The bearing (4) that supports the clevis shoulder screw (10) is field serviceable. Remove the cover (see section 25) and the drive cables (see section 34). Tap or press out the bearing (4). Press in the new bearing by tapping it in with the shoulder bolt. Make sure to grease the new bearing using a few drops of light machine oil (example: TRI-FLO or 3-in-1 oil). To reassemble see section 30.

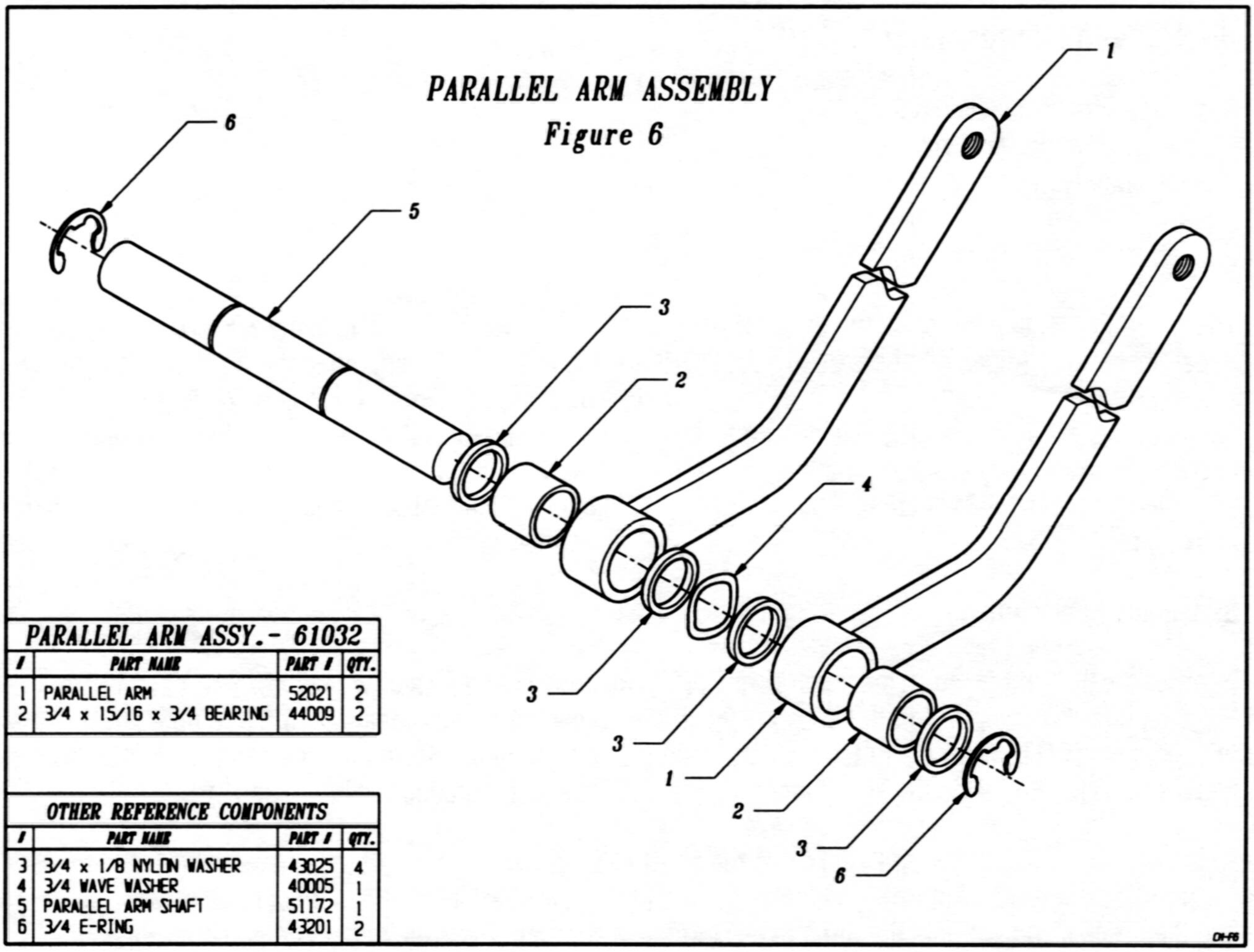
37.2 Pivot shaft

The bearings (3) that ride on the pivot shaft (7) can be greased or oiled. Use a grease gun to apply a polymer grease through the grease fittings on the crank arm. To disassemble, use the retaining ring pliers to remove the C-rings (5) and slide the pivot shaft (7) out. To reassemble take care to get the washers (8) and wave spring washer (6) back on in the same order that they came off.

38. Parallel Arm Assembly (see Fig. 6)

Tools: *Small Flathead Screwdriver*

The parallel arm bearings (2) can be greased or oiled using a few drops of light machine oil (example: TRI-FLO or 3-in-1 oil). To disassemble, pry off the E-rings (6) using the screwdriver and slide the shaft out. To reassemble take care to get the washers (3) back on in the same order that they came off.



PARALLEL ARM ASSEMBLY

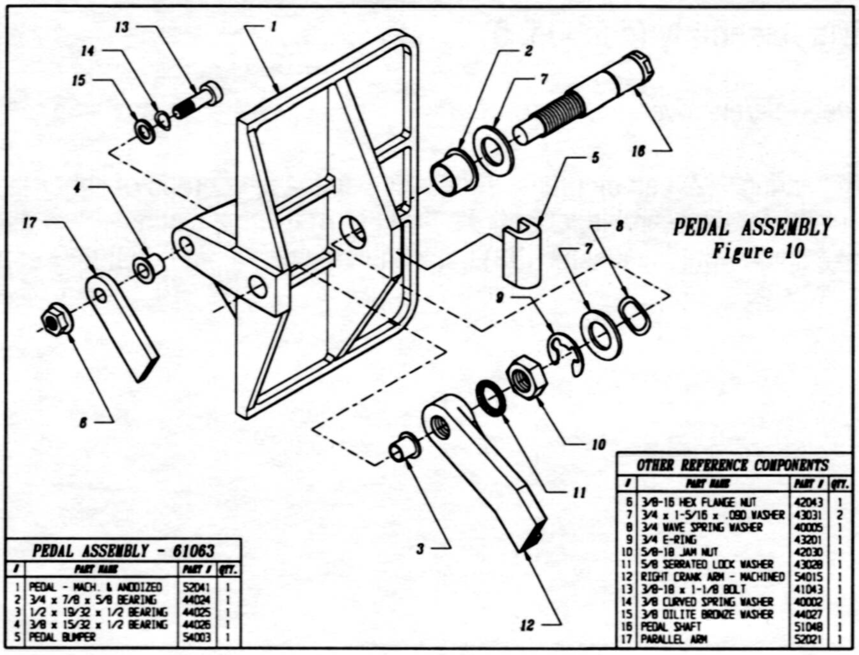
Figure 6

PARALLEL ARM ASSY.- 61032

#	PART NAME	PART #	QTY.
1	PARALLEL ARM	52021	2
2	3/4 x 15/16 x 3/4 BEARING	44009	2

OTHER REFERENCE COMPONENTS

#	PART NAME	PART #	QTY.
3	3/4 x 1/8 NYLON WASHER	43025	4
4	3/4 WAVE WASHER	40005	1
5	PARALLEL ARM SHAFT	51172	1
6	3/4 E-RING	43201	2



PEDAL ASSEMBLY
Figure 10

PEDAL ASSEMBLY - 61063			
#	PART NAME	PART #	QTY.
1	PEDAL - MACH. & ANODIZED	52041	1
2	3/4 x 7/8 x 5/8 BEARING	44024	1
3	1/2 x 19/32 x 1/2 BEARING	44025	1
4	3/8 x 15/32 x 1/2 BEARING	44026	1
5	PEDAL BUMPER	54003	1

OTHER REFERENCE COMPONENTS			
#	PART NAME	PART #	QTY.
6	3/8-16 HEX FLANGE NUT	42043	1
7	3/4 x 1-5/16 x .090 WASHER	43031	2
8	3/4 WAVE SPRING WASHER	40005	1
9	3/4 E-RING	43201	1
10	5/8-18 JAM NUT	42030	1
11	5/8 SERRATED LOCK WASHER	43028	1
12	RIGHT CRANK ARM - MACHINED	54015	1
13	3/8-18 x 1-1/8 BOLT	41043	1
14	3/8 CURVED SPRING WASHER	40002	1
15	3/8 OILITE BRONZE WASHER	44027	1
16	PEDAL SHAFT	51048	1
17	PARALLEL ARM	52021	1

39. Pedal Assembly (see Fig. 10)

Tools: *Adjustable Jaw Wrench*
3/16" Allen Hex Wrench
Small Flathead Screwdriver

39.1 Parallel Arm Bearing Replacement

The bearing (4) that supports the parallel arm (17) is field serviceable. Remove the 3/8"-16 nut (6) from the Pedal Screw (13) (older climbers used a 5/16"-18 nut and a 3/8" x 5/8" shoulder screw). Unscrew the pedal screw (13) from the parallel arm (17). Press out the bearing (4). Press in the new bearing (4) by tapping it in with the pedal screw (13). Make sure to grease the new bearing.Reassemble.Tighten the pedal screw finger tight (5 inch-lb) ensuring that the pedal moves freely, then tighten the 3/8" nut (35-50 ft-lb). **NOTE:** When tightening the 3/8" nut onto the pedal screw, hold back with the Allen wrench to prevent the screw from backing off.

39.2 Pedal Replacement

Remove the 3/8" nut (6) from the pedal screw (13). Unscrew the pedal screw (13) from the parallel arm (17). Flip the pedal (1) over, pry off the E-ring (9) with the screwdriver and loosen the 5/8"-18 nut (10). Unscrew the pedal shaft (16) from the crank arm (12) and remove the pedal. Remove the 5/8"-18 nut (10) from the pedal shaft (16) and slide the shaft out of the pedal. Inspect and grease the bearings (2) & (3).

To reassemble, slide the washer (7) on to the shaft (16) and slide the shaft into the pedal (1). Put the wave spring (8), washer (7), nut (10) and lock washer (11) on the shaft inside the pedal (1). Screw the shaft (16) into the crank arm (12) until the threads start to come through. Slide the pedal (1), and compress the wave spring (8) and washer (7) over to the shaft (16) shoulder and snap on the E-ring (9). Unscrew the shaft (16) until there is 1/32" between the crank arm (12) and the pedal (1). Tighten the 5/8"-18 nut (10) on to the crank arm. Reassemble the parallel arm (17), pedal screw (13) and nut (6). **NOTE:** When tightening the 3/8" nut onto the pedal screw, hold back with the Allen wrench to prevent the screw from backing off.

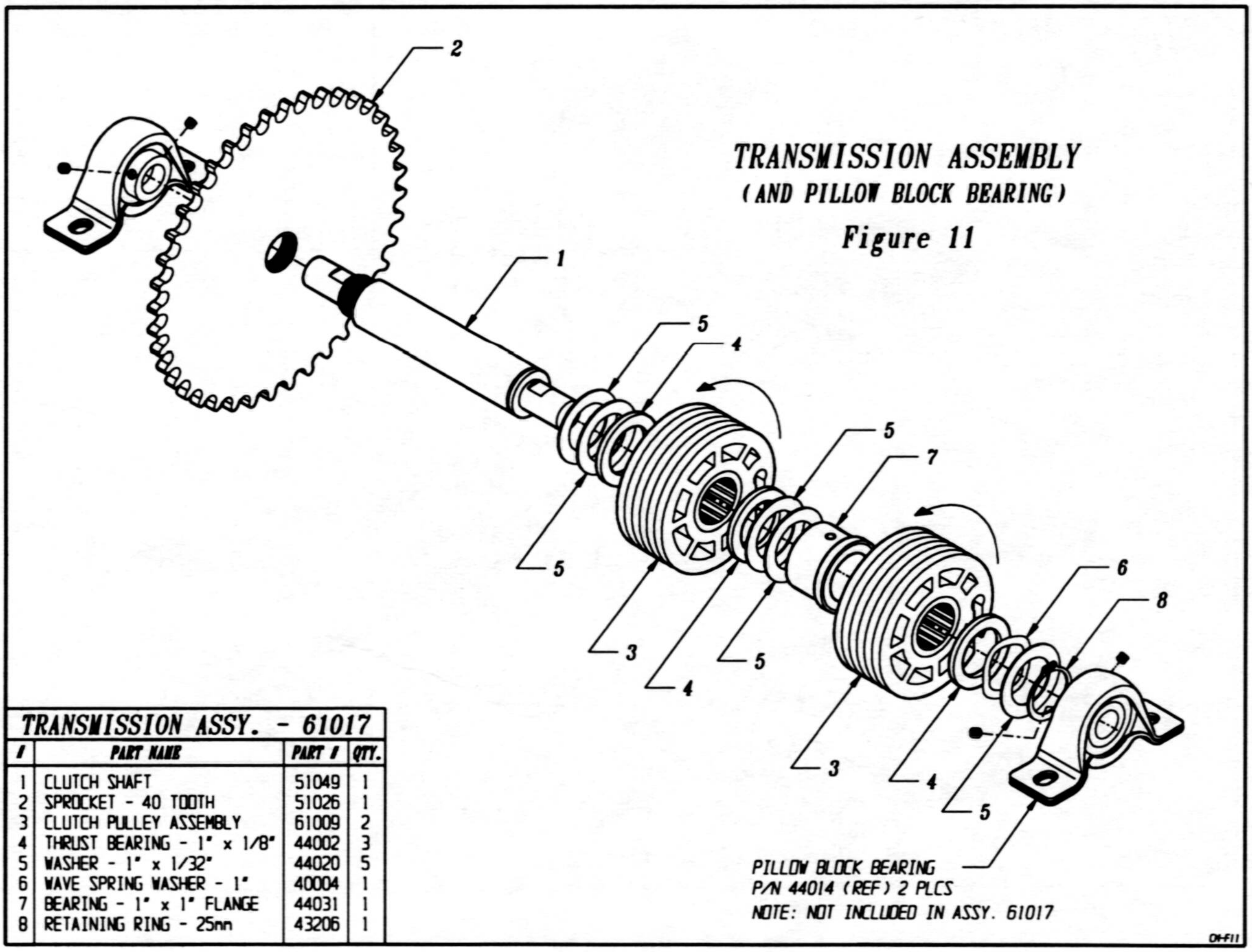
40. Transmission Assembly (see Fig. 11)

Tools: *Adjustable Jaw Wrench*
3/32" Allen Hex Wrench
Retaining Ring Pliers

40.1 Transmission Replacement

Remove the cover (see section 25). Pull up on the pedal return cable to release the ball from the clutch pulley (see Fig. 7). Remove the cables (see section 34). Loosen the set screws on the pillow blocks that support the transmission. Remove the four 5/16"-18 screws that hold the pillow blocks and remove the transmission.

To replace the transmission, slide the pillow blocks on each end of the transmission and loop the chain around the sprocket. Attach the pillow blocks to the uprights with the 5/16"- 18 screws. Sight through the chain and align the sprocket by moving the pillow blocks forward and back. Tension the chain so that it has 1/2" of play. Tighten the 5/16"-18 screws. Turn the shaft in each pillow block so that one set screw goes directly down onto the flat in each end of the clutch shaft. Tighten both set screws in each pillow block. Install the drive cables (see section 34). Plug power in and try climbing.



TRANSMISSION ASSEMBLY
(AND PILLOW BLOCK BEARING)
Figure 11

TRANSMISSION ASSY. - 61017

#	PART NAME	PART #	QTY.
1	CLUTCH SHAFT	51049	1
2	SPROCKET - 40 TOOTH	51026	1
3	CLUTCH PULLEY ASSEMBLY	61009	2
4	THRUST BEARING - 1" x 1/8"	44002	3
5	WASHER - 1" x 1/32"	44020	5
6	WAVE SPRING WASHER - 1"	40004	1
7	BEARING - 1" x 1" FLANGE	44031	1
8	RETAINING RING - 25mm	43206	1

PILLOW BLOCK BEARING
P/N 44014 (REF) 2 PLCS
NOTE: NOT INCLUDED IN ASSY. 61017

40.2 Clutch Pulley Replacement

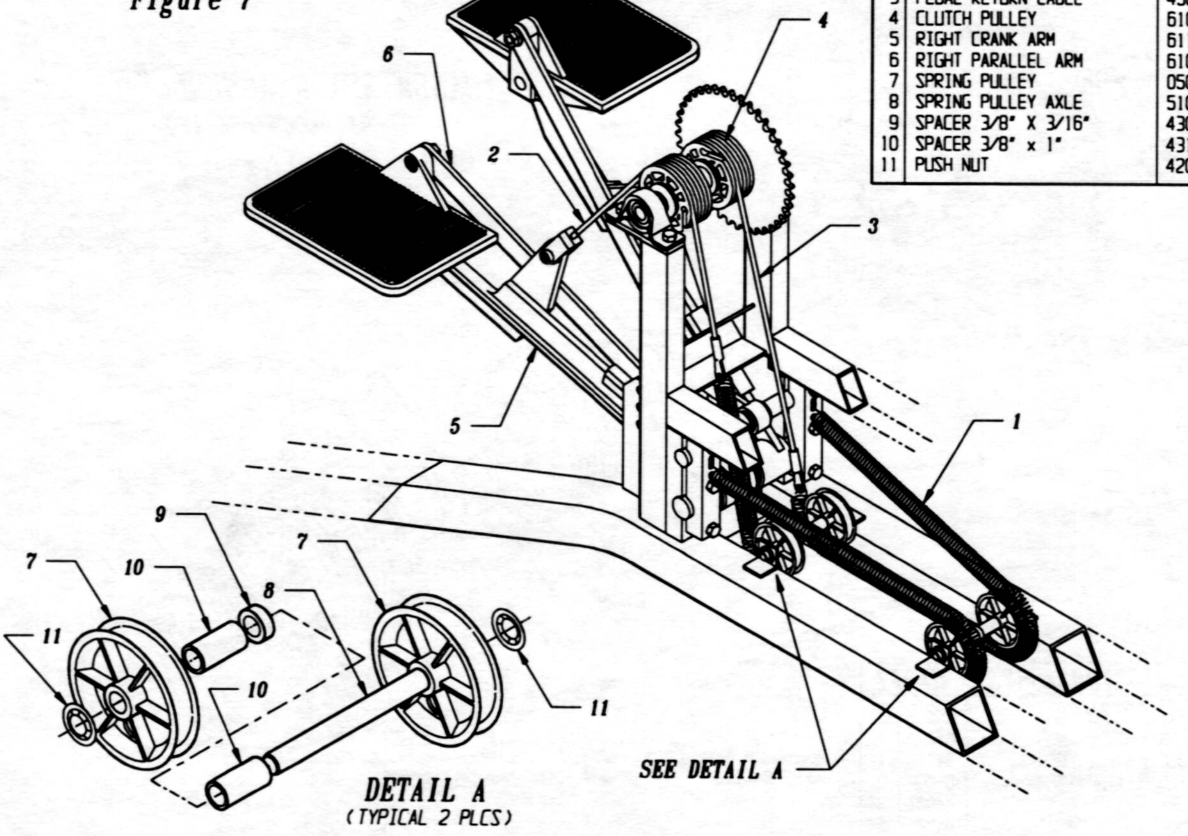
Remove the transmission (see section 40.1). Remove the C-ring (9) and slide off the washers (6), bearings (5) and spring (7) to remove the clutch pulley (4). When reassembling, make sure that the arrows on the clutch are oriented as shown in Fig. 8. If lube is applied to the clutch pulleys, **use 90-weight gear oil only.**

40.3 Clutch Shaft Replacement

Follow instructions outlined in section 40.1. Replace the sprocket and clutch shaft together as an assembly (part number 61091). The sprocket has a left hand thread and becomes very tight on the clutch shaft once it has been in use. This causes the sprocket to be extremely difficult to remove from the shaft.

SPRING CABLE ROUTING

Figure 7



SPRING CABLE ROUTING

#	PART NAME	PART #	QTY.
1	PEDAL RETURN SPRING	40027	2
2	DRIVE CABLE (3/8" CLEVIS)	51045	2
3	PEDAL RETURN CABLE	45007	2
4	CLUTCH PULLEY	61009	2
5	RIGHT CRANK ARM	61147	1
6	RIGHT PARALLEL ARM	61032	1
7	SPRING PULLEY	05036	4
8	SPRING PULLEY AXLE	51069	2
9	SPACER 3/8" X 3/16"	43041	2
10	SPACER 3/8" x 1"	43123	4
11	PUSH NUT	42020	4

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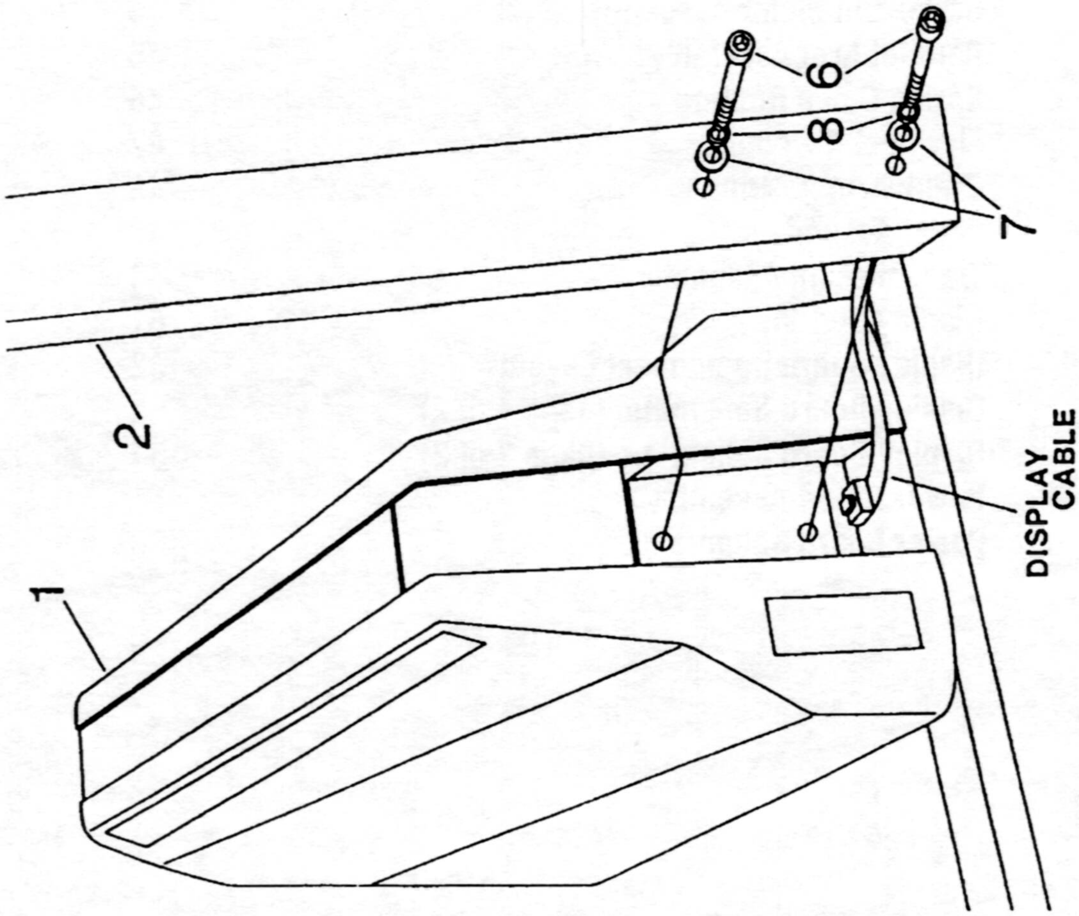
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DISPLAY CABLE

Fig. 1

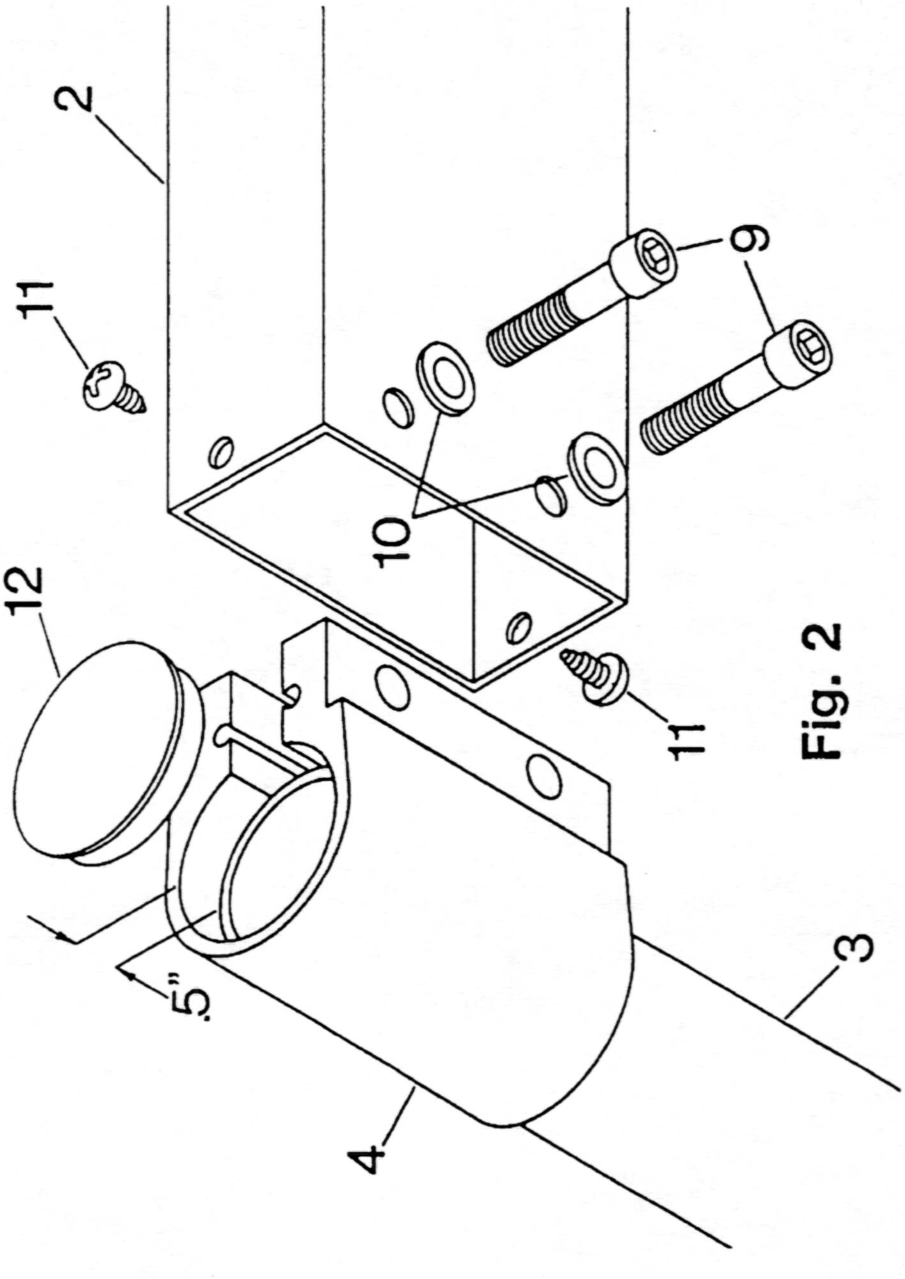
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Fig. 2

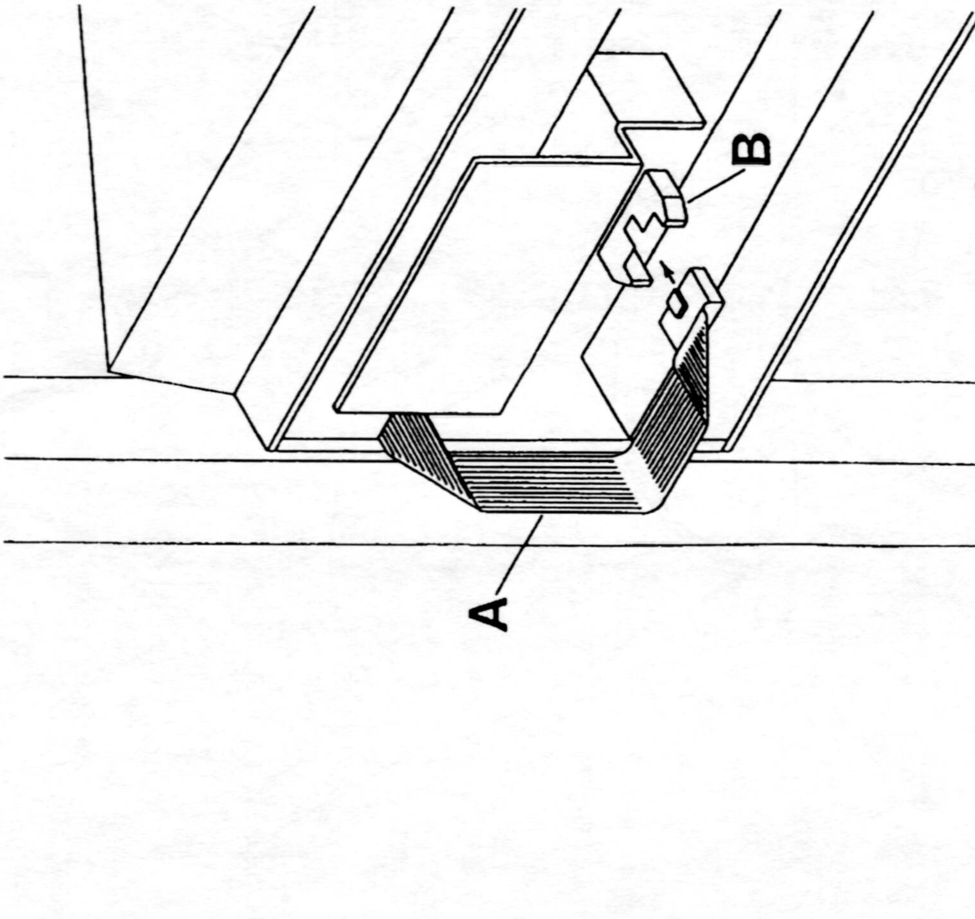
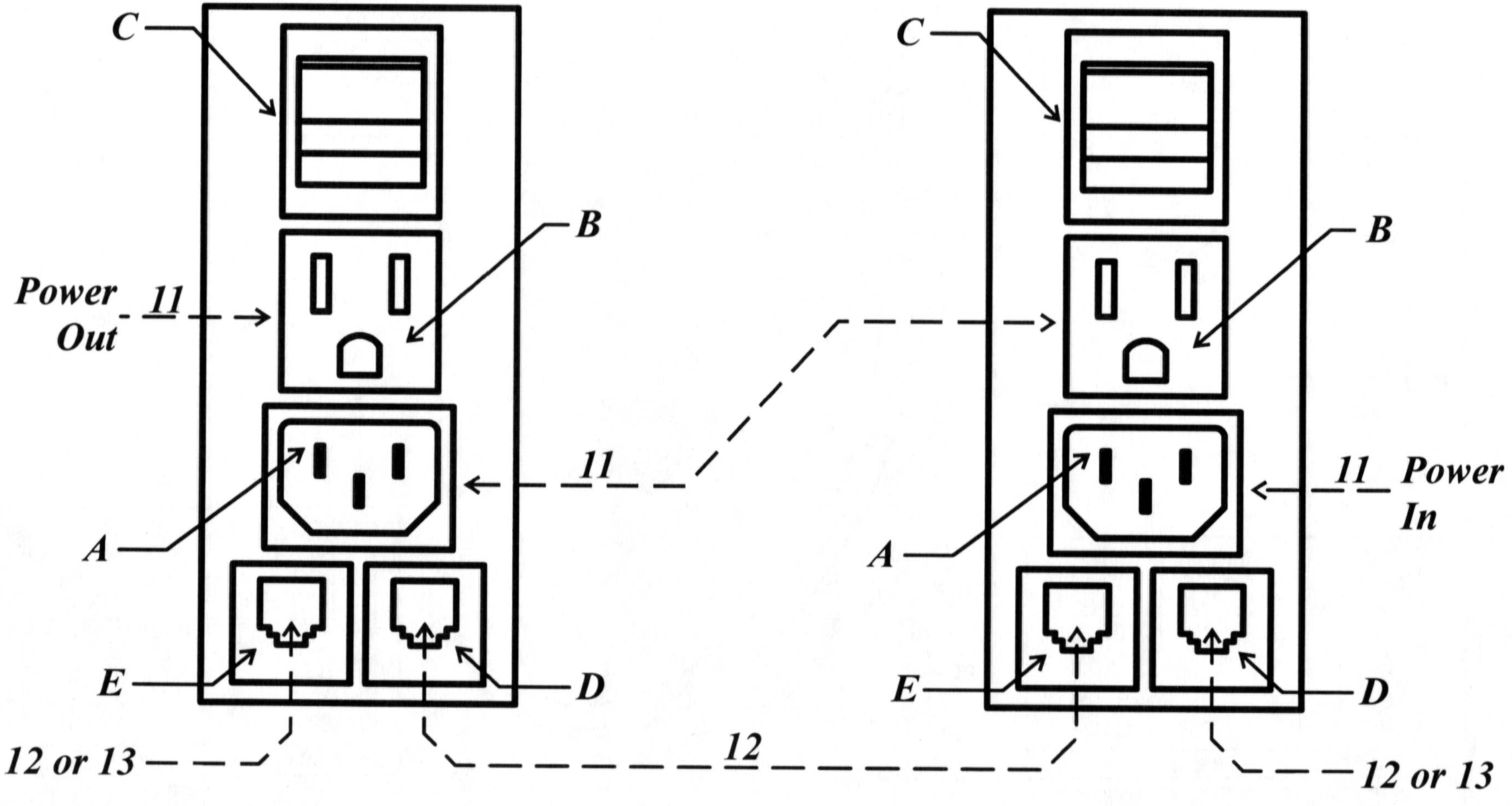


Fig. 3

Fig. 4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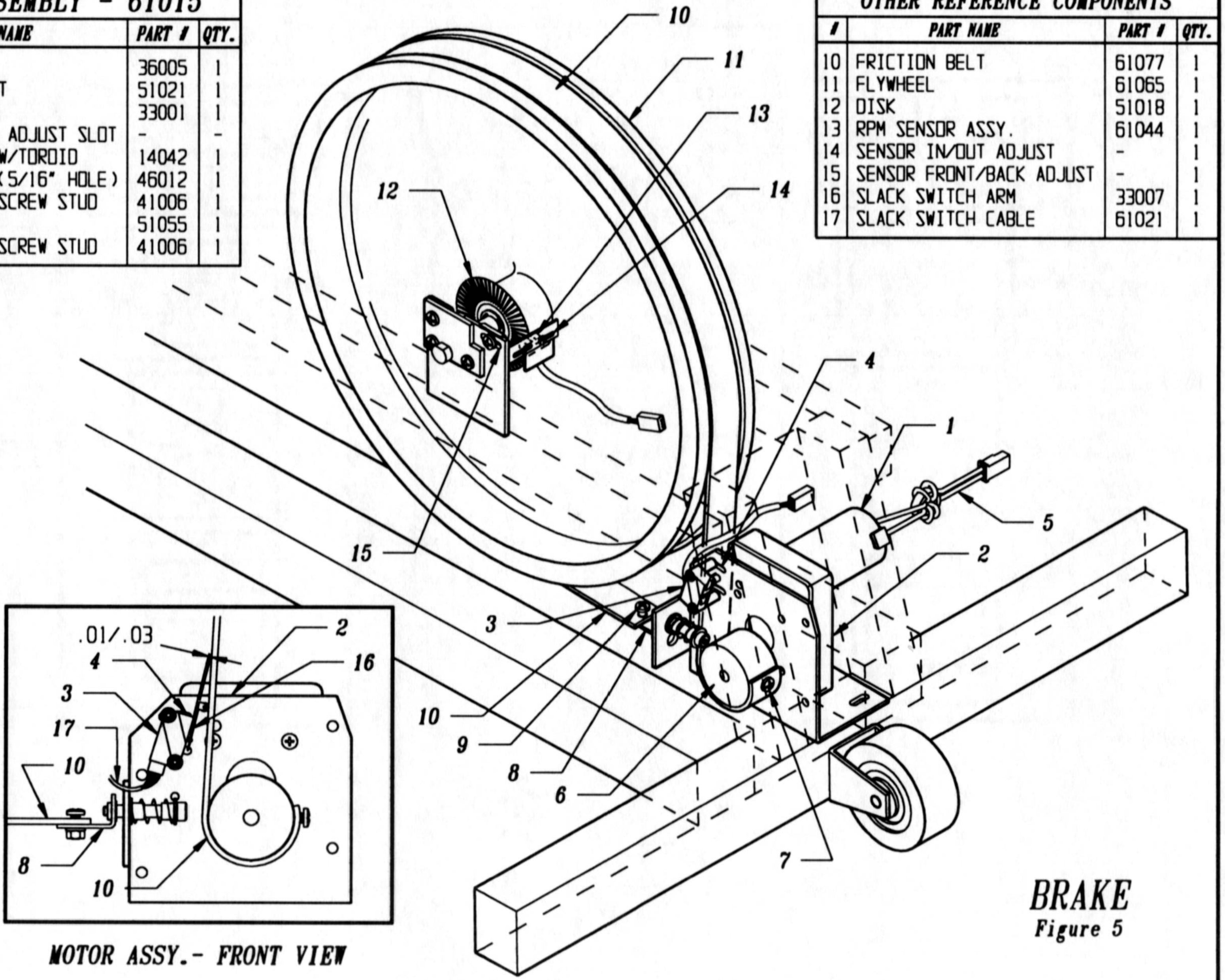
Power
Out
11
B
A
11
E
D
12 or 13
12
C
B
11
Power
In
A
E
D
12 or 13

MOTOR ASSEMBLY - 61015

#	PART NAME	PART #	QTY.
1	GEAR MOTOR	36005	1
2	MOTOR BRACKET	51021	1
3	SLACK SWITCH	33001	1
4	SLACK SWITCH ADJUST SLOT	-	-
5	MOTOR LEADS W/TOROID	14042	1
6	BELT PULLEY (5/16" HOLE)	46012	1
7	BELT PULLEY SCREW STUD	41006	1
8	BELT ANCHOR	51055	1
9	BELT ANCHOR SCREW STUD	41006	1

OTHER REFERENCE COMPONENTS

#	PART NAME	PART #	QTY.
10	FRICTION BELT	61077	1
11	FLYWHEEL	61065	1
12	DISK	51018	1
13	RPM SENSOR ASSY.	61044	1
14	SENSOR IN/OUT ADJUST	-	1
15	SENSOR FRONT/BACK ADJUST	-	1
16	SLACK SWITCH ARM	33007	1
17	SLACK SWITCH CABLE	61021	1



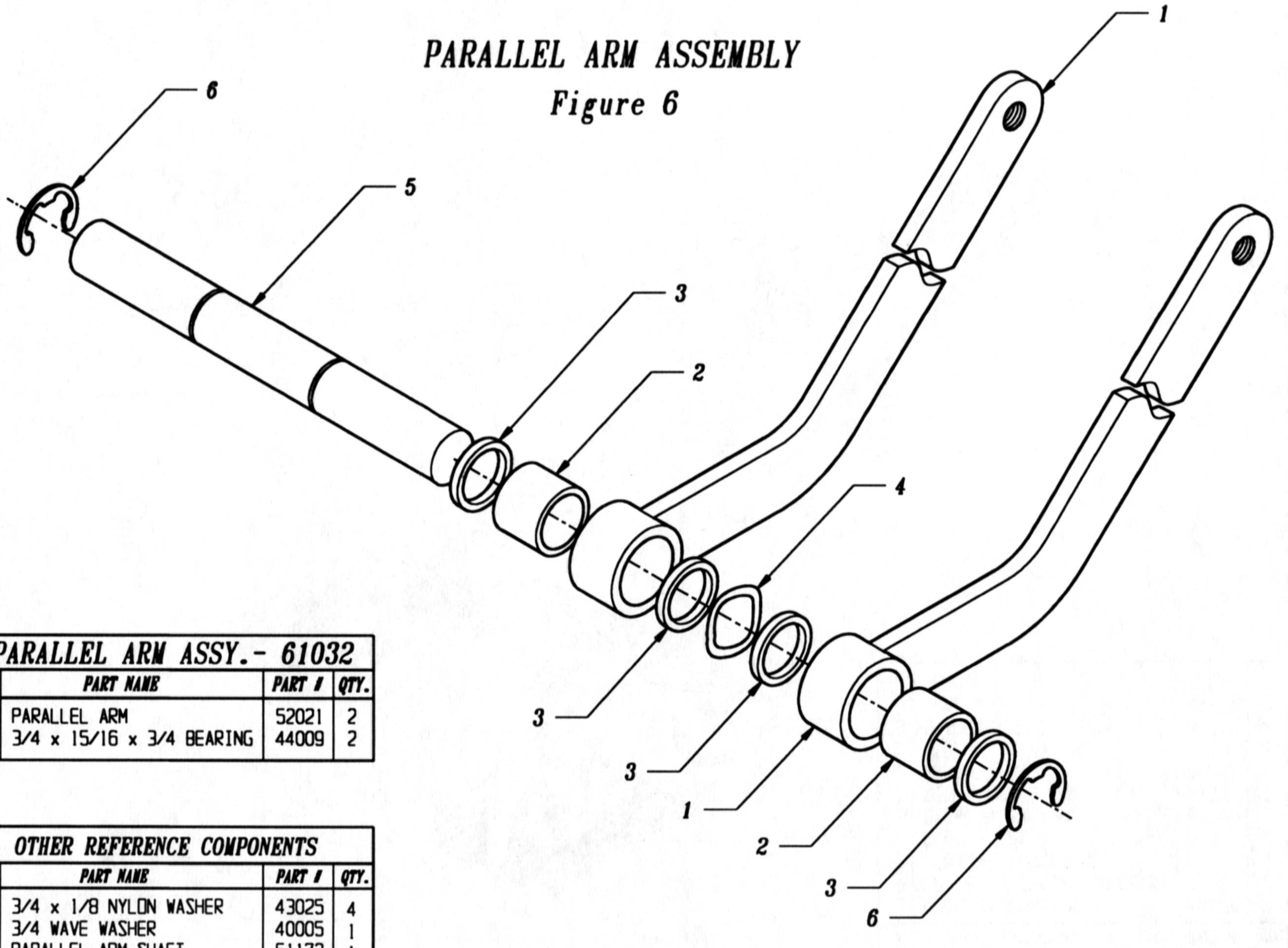
MOTOR ASSY.- FRONT VIEW

BRAKE
Figure 5

CM-FG5

PARALLEL ARM ASSEMBLY

Figure 6



PARALLEL ARM ASSY.- 61032

#	PART NAME	PART #	QTY.
1	PARALLEL ARM	52021	2
2	3/4 x 15/16 x 3/4 BEARING	44009	2

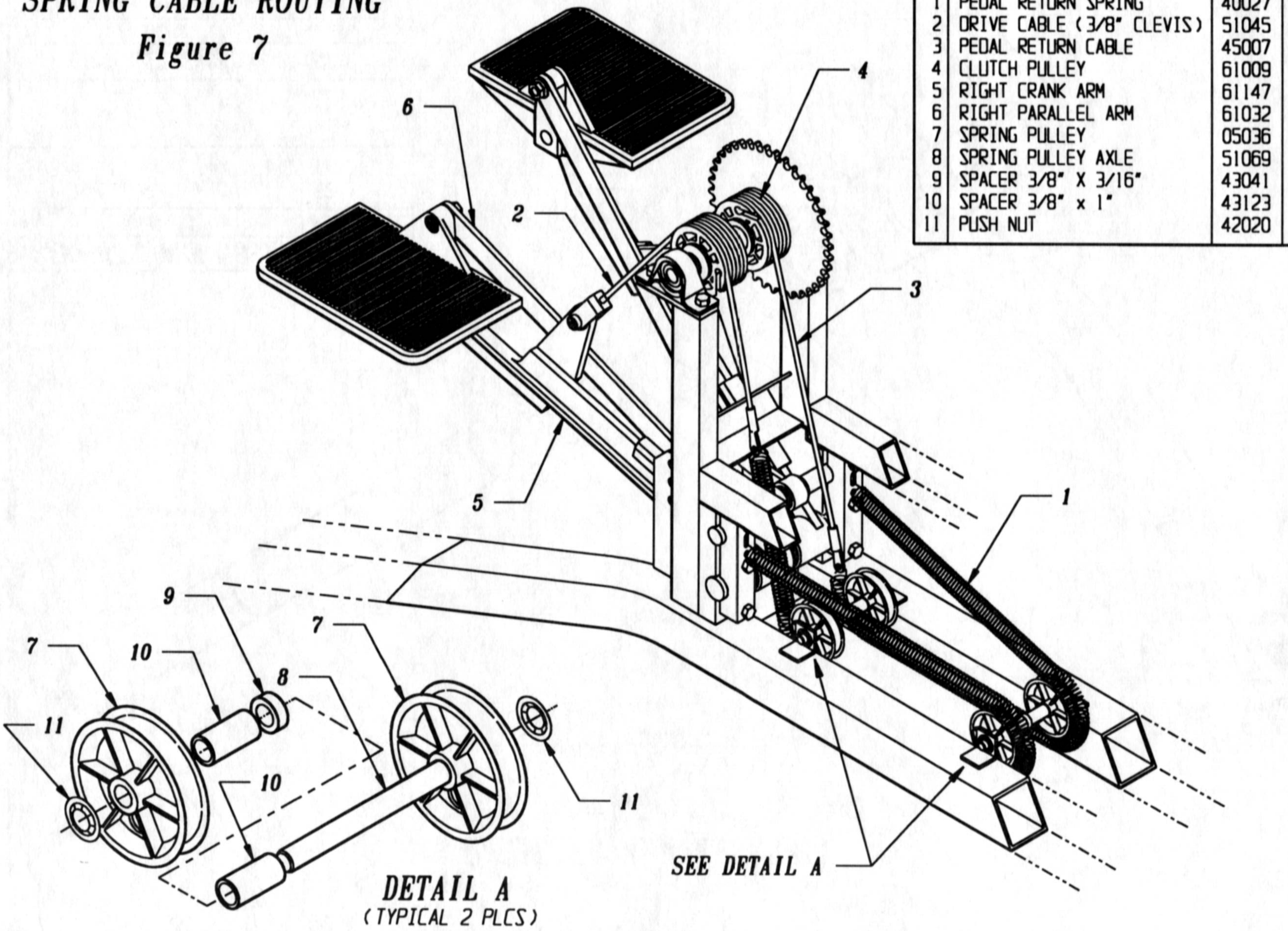
OTHER REFERENCE COMPONENTS

#	PART NAME	PART #	QTY.
3	3/4 x 1/8 NYLON WASHER	43025	4
4	3/4 WAVE WASHER	40005	1
5	PARALLEL ARM SHAFT	51172	1
6	3/4 E-RING	43201	2

CH-F6

SPRING CABLE ROUTING

Figure 7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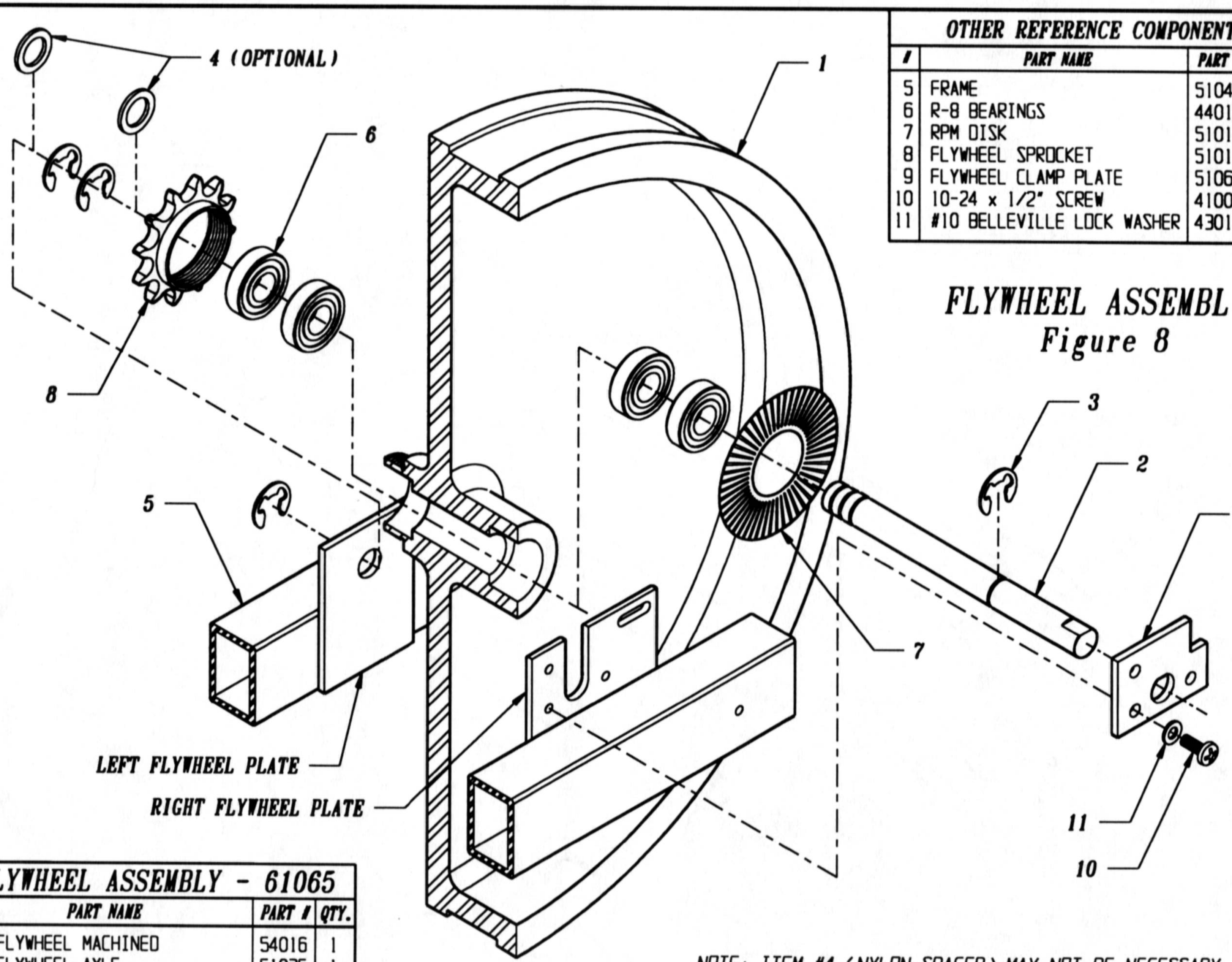
10
11
SEE DETAIL A
DETAIL A
(TYPICAL 2 PLCS)

SPRING CABLE ROUTING

#	PART NAME	PART #	QTY.
1	PEDAL RETURN SPRING	40027	2
2	DRIVE CABLE (3/8" CLEVIS)	51045	2
3	PEDAL RETURN CABLE	45007	2
4	CLUTCH PULLEY	61009	2
5	RIGHT CRANK ARM	61147	1
6	RIGHT PARALLEL ARM	61032	1
7	SPRING PULLEY	05036	4
8	SPRING PULLEY AXLE	51069	2
9	SPACER 3/8" X 3/16"	43041	2
10	SPACER 3/8" x 1"	43123	4
11	PUSH NUT	42020	4

FLYWHEEL ASSEMBLY
Figure 8


4 (OPTIONAL)
1
6
8
3
2
5
9
7
LEFT FLYWHEEL PLATE
RIGHT FLYWHEEL PLATE
11
10

OTHER REFERENCE COMPONENTS

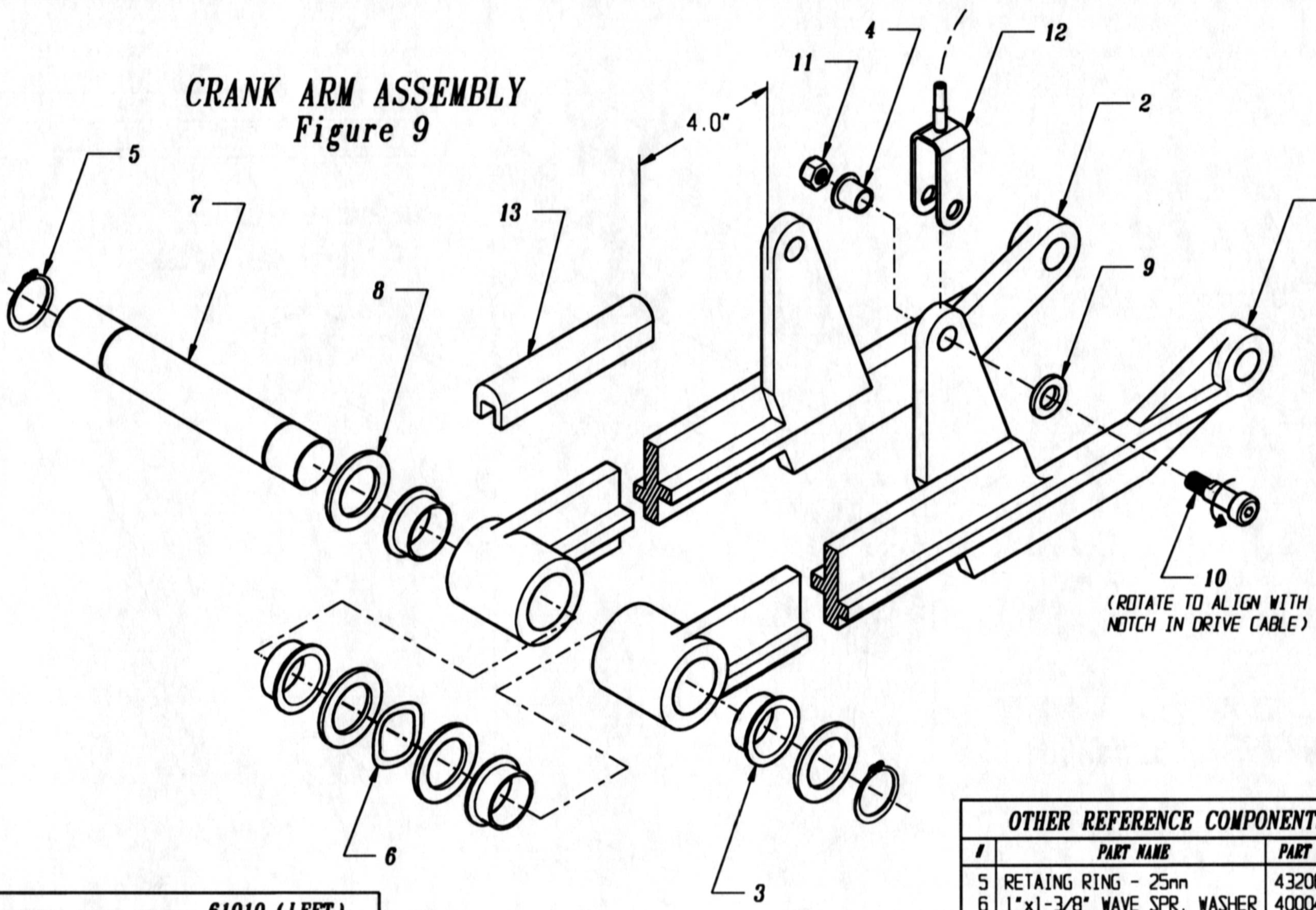
#	PART NAME	PART #	QTY.
5	FRAME	51046	1
6	R-8 BEARINGS	44015	4
7	RPM DISK	51018	1
8	FLYWHEEL SPROCKET	51011	1
9	FLYWHEEL CLAMP PLATE	51064	1
10	10-24 x 1/2" SCREW	41006	3
11	#10 BELLEVILLE LOCK WASHER	43011	3

FLYWHEEL ASSEMBLY - 61065

#	PART NAME	PART #	QTY.
1	FLYWHEEL MACHINED	54016	1
2	FLYWHEEL AXLE	51035	1
3	1/2" E-RING	43196	4
4	1/2" NYLON SPACER	43021	1

NOTE: ITEM #4 (NYLON SPACER) MAY NOT BE NECESSARY OR THERE MAY BE MORE THAN ONE.

CRANK ARM ASSEMBLY
Figure 9



(ROTATE TO ALIGN WITH NOTCH IN DRIVE CABLE)

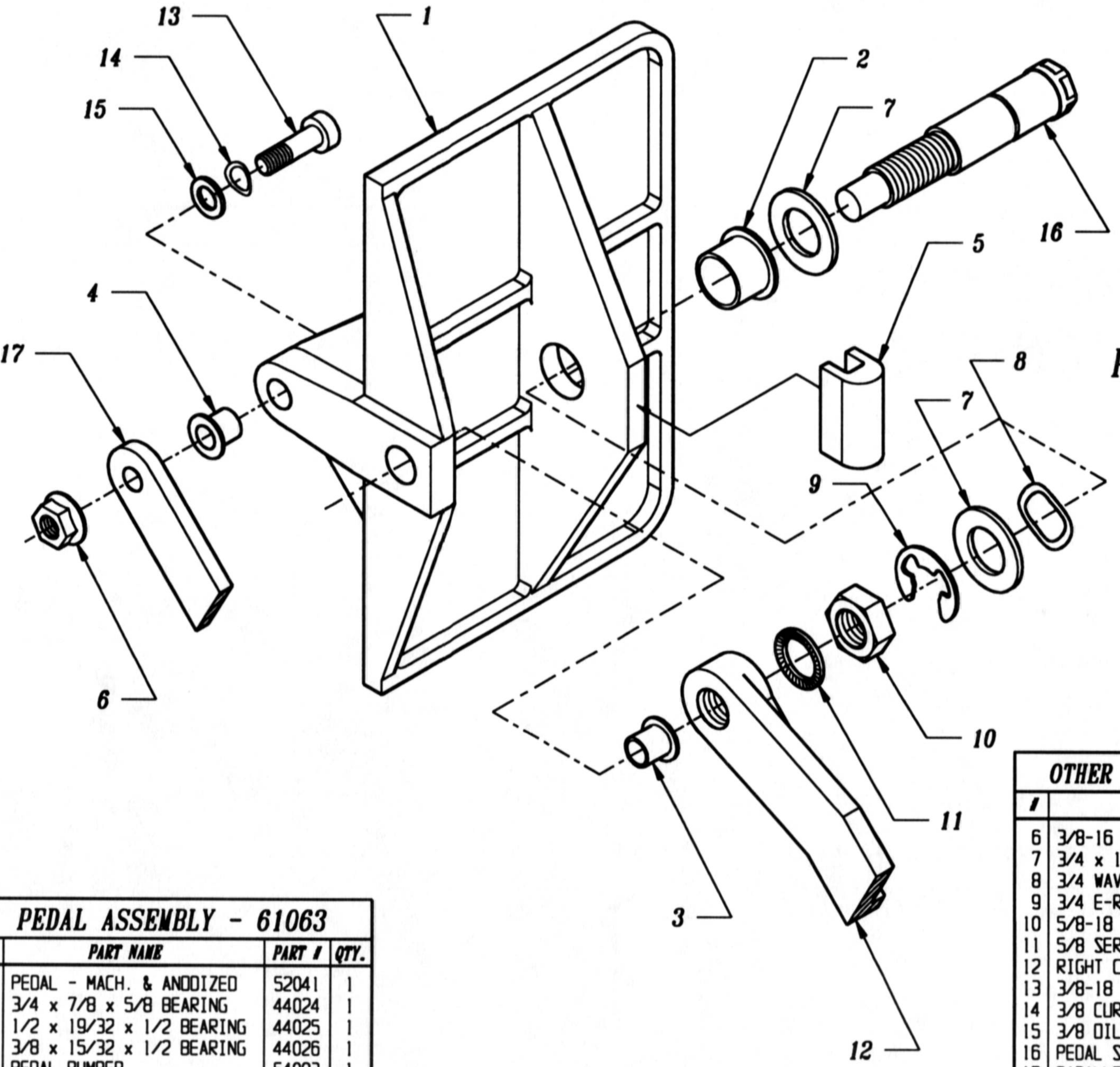
CRANK ARM ASSY. 61010 (LEFT) 61147 (RIGHT)

#	PART NAME	PART #	QTY.
1	CRANK ARM - LEFT	54014	1
2	CRANK ARM - RIGHT	54015	1
3	1"x1-1/8"x1/2" BEARING	44021	4
4	3/8"x15/32"x1/2" BEARING	44026	2

OTHER REFERENCE COMPONENTS

#	PART NAME	PART #	QTY.
5	RETAING RING - 25mm	43206	2
6	1"x1-3/8" WAVE SPR. WASHER	40004	1
7	PIVOT SHAFT	51068	1
8	1"x1/2"x.10 THR. WASHER	40031	4
9	.48"x.10" NYLON WASHER	43029	2
10	3/8"x3/4" CLEVIS SCREW	53016	2
11	5/16"-18 NYLOC NUT	42033	2
12	DRIVE CABLE	51045	2
13	CRANK ARM BUMPER	54002	2

PEDAL ASSEMBLY
Figure 10



PEDAL ASSEMBLY - 61063

#	PART NAME	PART #	QTY.
1	PEDAL - MACH. & ANODIZED	52041	1
2	3/4 x 7/8 x 5/8 BEARING	44024	1
3	1/2 x 19/32 x 1/2 BEARING	44025	1
4	3/8 x 15/32 x 1/2 BEARING	44026	1
5	PEDAL BUMPER	54003	1

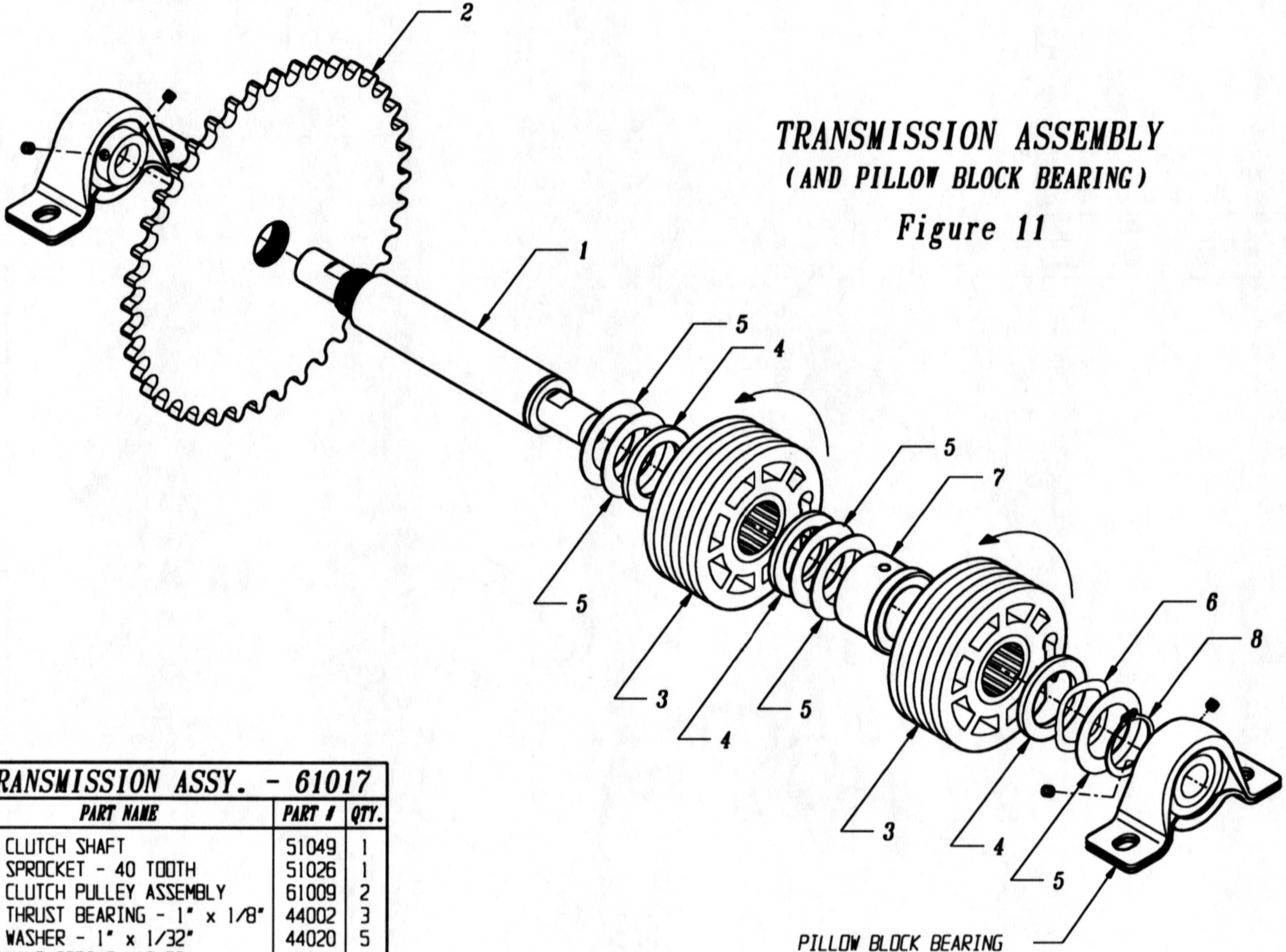
OTHER REFERENCE COMPONENTS

#	PART NAME	PART #	QTY.
6	3/8-16 HEX FLANGE NUT	42043	1
7	3/4 x 1-5/16 x .090 WASHER	43031	2
8	3/4 WAVE SPRING WASHER	40005	1
9	3/4 E-RING	43201	1
10	5/8-18 JAM NUT	42030	1
11	5/8 SERRATED LOCK WASHER	43028	1
12	RIGHT CRANK ARM - MACHINED	54015	1
13	3/8-18 x 1-1/8 BOLT	41043	1
14	3/8 CURVED SPRING WASHER	40002	1
15	3/8 OILITE BRONZE WASHER	44027	1
16	PEDAL SHAFT	51048	1
17	PARALLEL ARM	52021	1

TRANSMISSION ASSEMBLY

(AND PILLOW BLOCK BEARING)

Figure 11



PILLOW BLOCK BEARING
P/N 44014 (REF) 2 PLCS
NOTE: NOT INCLUDED IN ASSY. 61017

TRANSMISSION ASSY. - 61017

#	PART NAME	PART #	QTY.
1	CLUTCH SHAFT	51049	1
2	SPROCKET - 40 TOOTH	51026	1
3	CLUTCH PULLEY ASSEMBLY	61009	2
4	THRUST BEARING - 1" x 1/8"	44002	3
5	WASHER - 1" x 1/32"	44020	5
6	WAVE SPRING WASHER - 1"	40004	1
7	BEARING - 1" x 1" FLANGE	44031	1
8	RETAINING RING - 25mm	43206	1

CM-F11

Figure 12

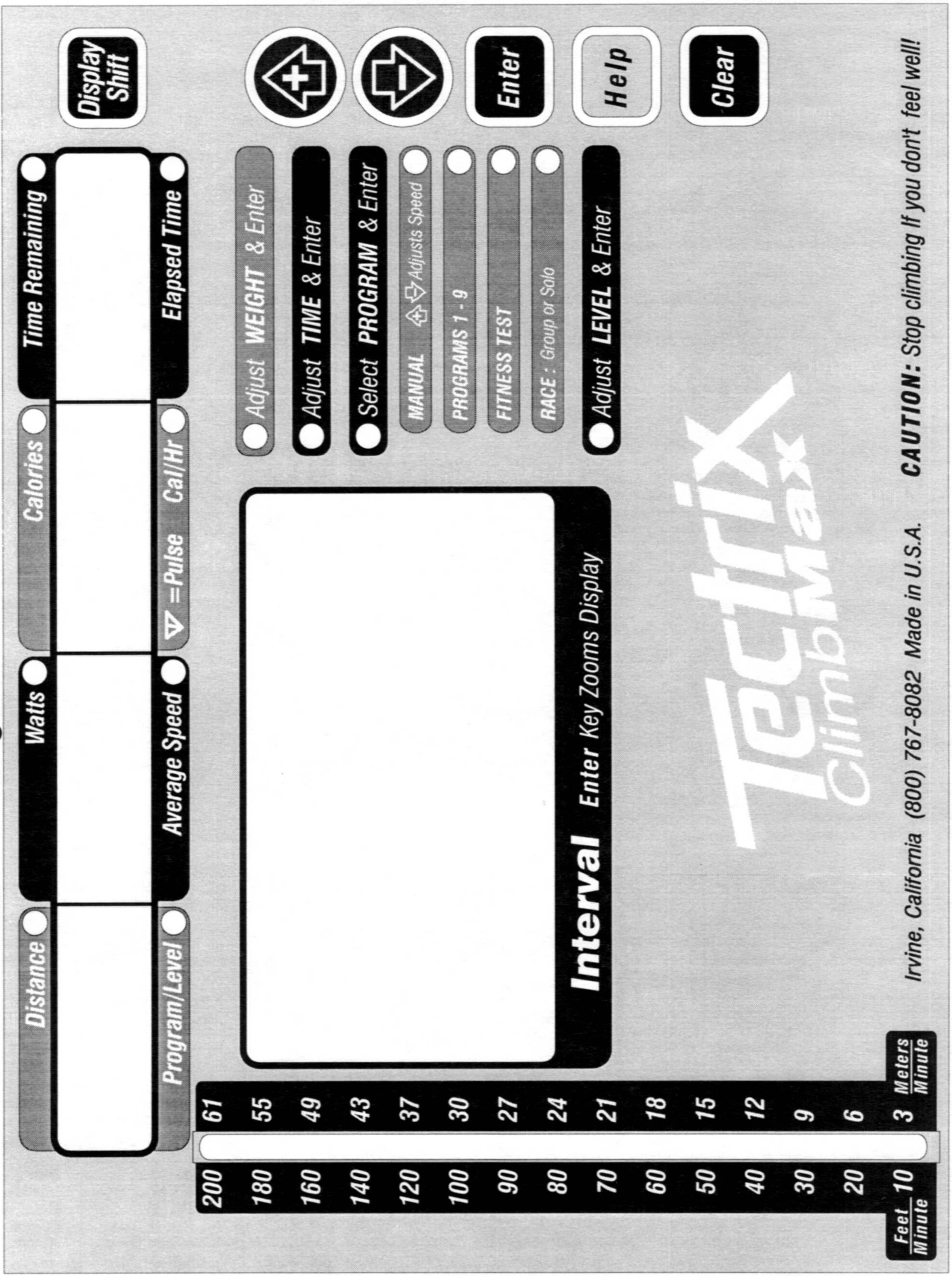
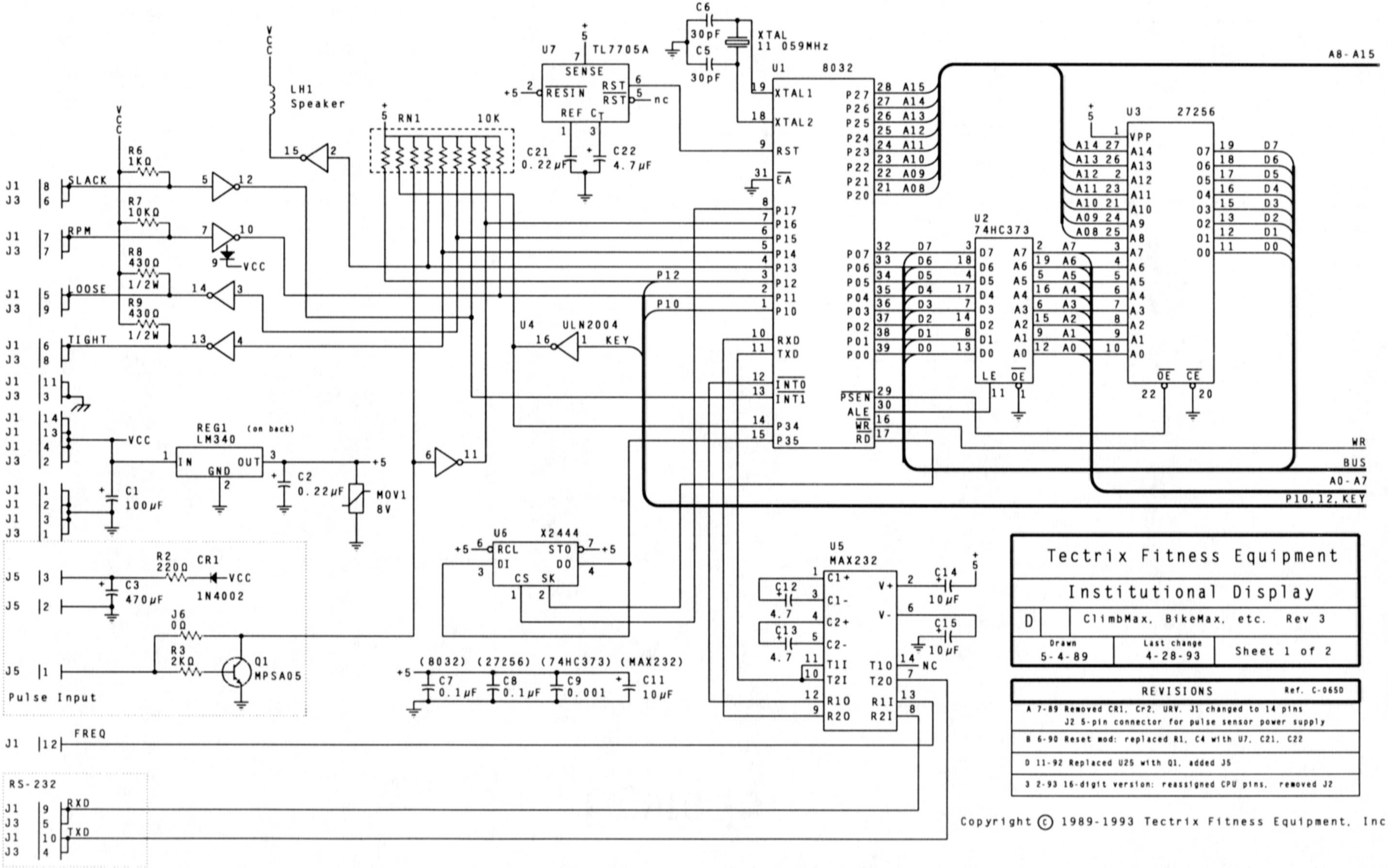

Display Shift
Time Remaining
Calories
Watts
Distance
Elapsed Time
Cal/Hr
=Pulse
Average Speed
Program/Level
Adjust WEIGHT & Enter
Adjust TIME & Enter
Select PROGRAM & Enter
MANUAL
Adjusts Speed
PROGRAMS 1 - 9
FITNESS TEST
RACE : Group or Solo
Adjust LEVEL & Enter
Enter
Help
Clear
Interval
Enter Key Zooms Display
Tectrix
ClimbMax
200
180
160
140
120
100
90
80
70
60
50
40
30
20
10
Feet / Minute
61
55
49
43
37
30
27
24
21
18
15
12
9
6
3
Meters / Minute
Irvine, California (800) 767-8082 Made in U.S.A.
CAUTION: Stop climbing If you don't feel well!

Figure 14


U1 8032
U2 74HC373
U3 27256
U4 ULN2004
U5 MAX232
U6 X2444
U7 TL7705A
REG1 (on back) LM340
XTAL 11 059MHz
C6 30pF
C5 30pF
C21 0.22μF
C22 4.7μF
LH1 Speaker
RN1 10K
R6 1KΩ
R7 10KΩ
R8 430Ω 1/2W
R9 430Ω 1/2W
R2 220Ω
R3 2KΩ
J6 0Ω
CR1 1N4002
Q1 MPSA05
C1 100μF
C2 0.22μF
C3 470μF
MOV1 8V
C12 4.7
C13 4.7
C14 10μF
C15 10μF
(8032) (27256) (74HC373) (MAX232)
C7 0.1μF
C8 0.1μF
C9 0.001
C11 10μF
SLACK
RPM
LOOSE
TIGHT
KEY
FREQ
RXD
TXD
VCC
+5
Pulse Input
RS-232
A8-A15
WR
BUS
A0-A7
P10,12,KEY
P12
P10
NC
nc

Tectrix Fitness Equipment

Institutional Display

D		ClimbMax, BikeMax, etc. Rev 3

Drawn 5-4-89	Last change 4-28-93	Sheet 1 of 2

REVISIONS Ref. C-065D

A 7-89 Removed CR1, Cr2, URV. J1 changed to 14 pins
J2 5-pin connector for pulse sensor power supply

B 6-90 Reset mod: replaced R1, C4 with U7, C21, C22

D 11-92 Replaced U25 with Q1, added J5

3 2-93 16-digit version: reassigned CPU pins, removed J2

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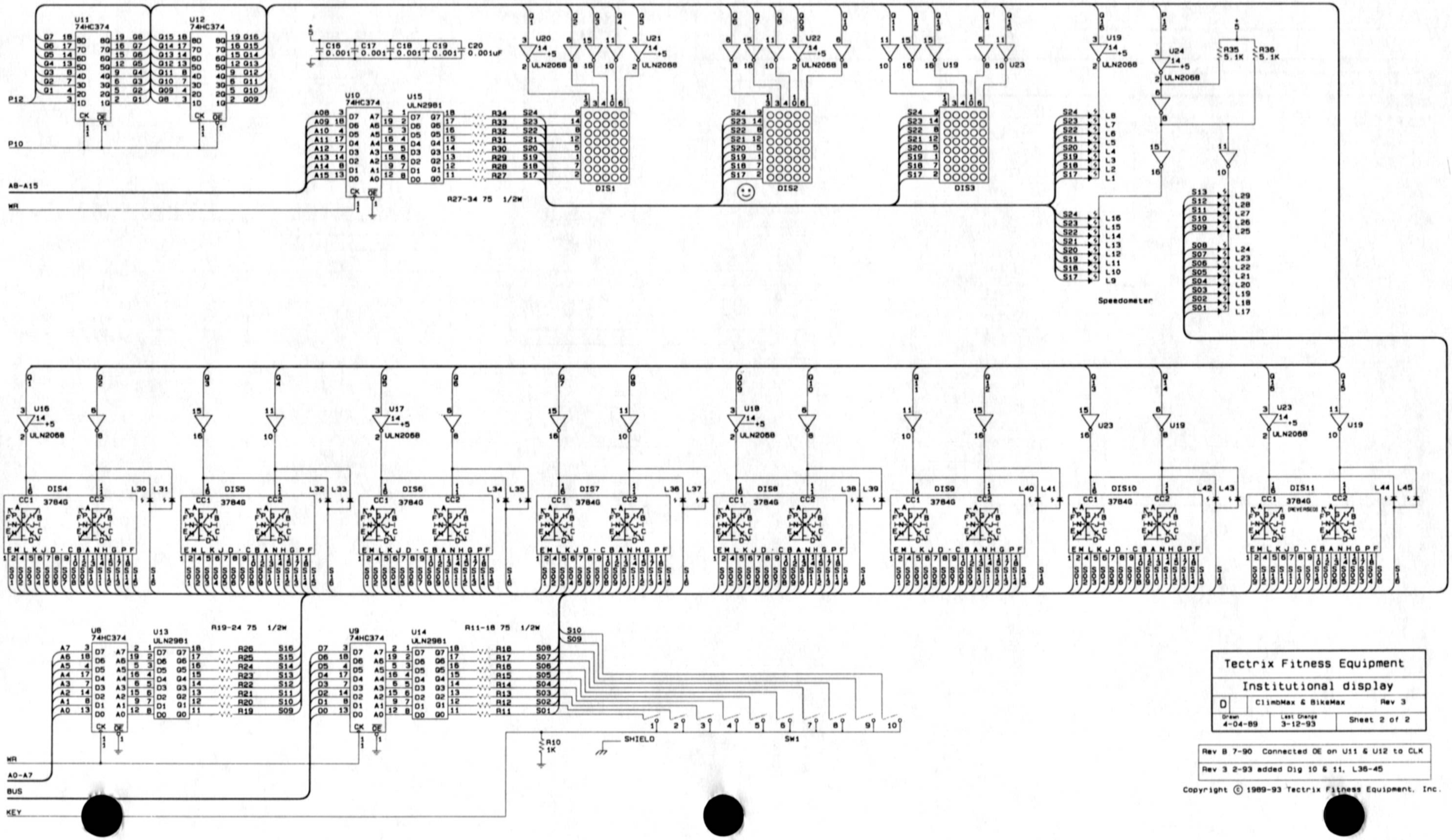
Figure 15


U11
74HC374
U12
74HC374
P12
P10
A8-A15
WR
U10
74HC374
U15
ULN2981
R27-34 75 1/2W
C16 0.001
C17 0.001
C18 0.001
C19 0.001
C20 0.001uF
U20
U21
U22
U23
U19
U24
ULN2068
R35 5.1K
R36 5.1K
DIS1
DIS2
DIS3
Speedometer
DIS4
DIS5
DIS6
DIS7
DIS8
DIS9
DIS10
DIS11
3784G
(REVERSED)
CC1
CC2
U16
U17
U18
U8
74HC374
U13
ULN2981
R19-24 75 1/2W
U9
74HC374
U14
ULN2981
R11-18 75 1/2W
R10
1K
SHIELD
SW1
WR
A0-A7
BUS
KEY

Tectrix Fitness Equipment

Institutional display

D		ClimbMax & BikeMax	Rev 3

Drawn	Last Change	
4-04-89	3-12-93	Sheet 2 of 2

Rev B 7-90 Connected OE on U11 & U12 to CLK

Rev 3 2-93 added Dig 10 & 11, L36-45

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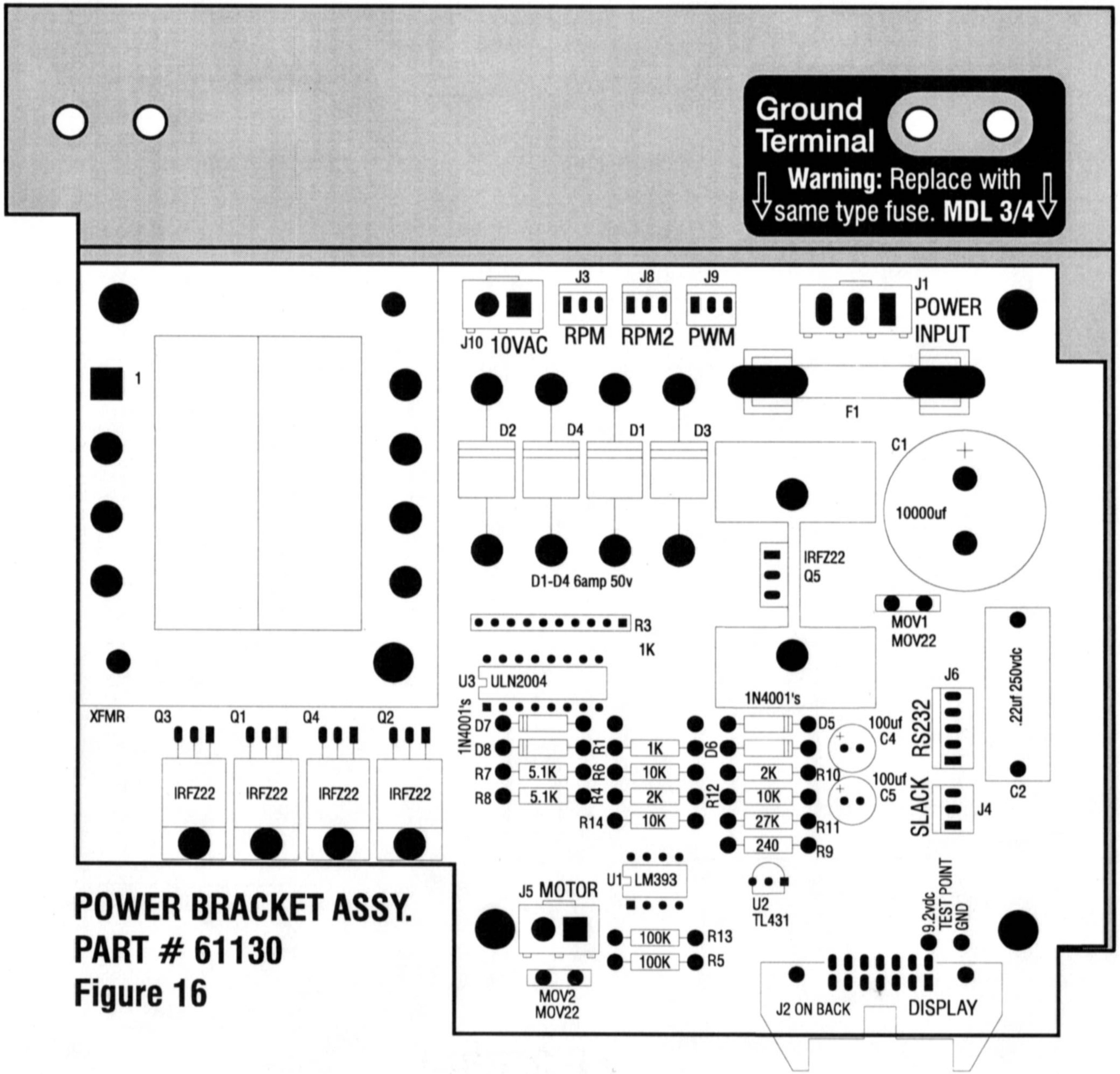
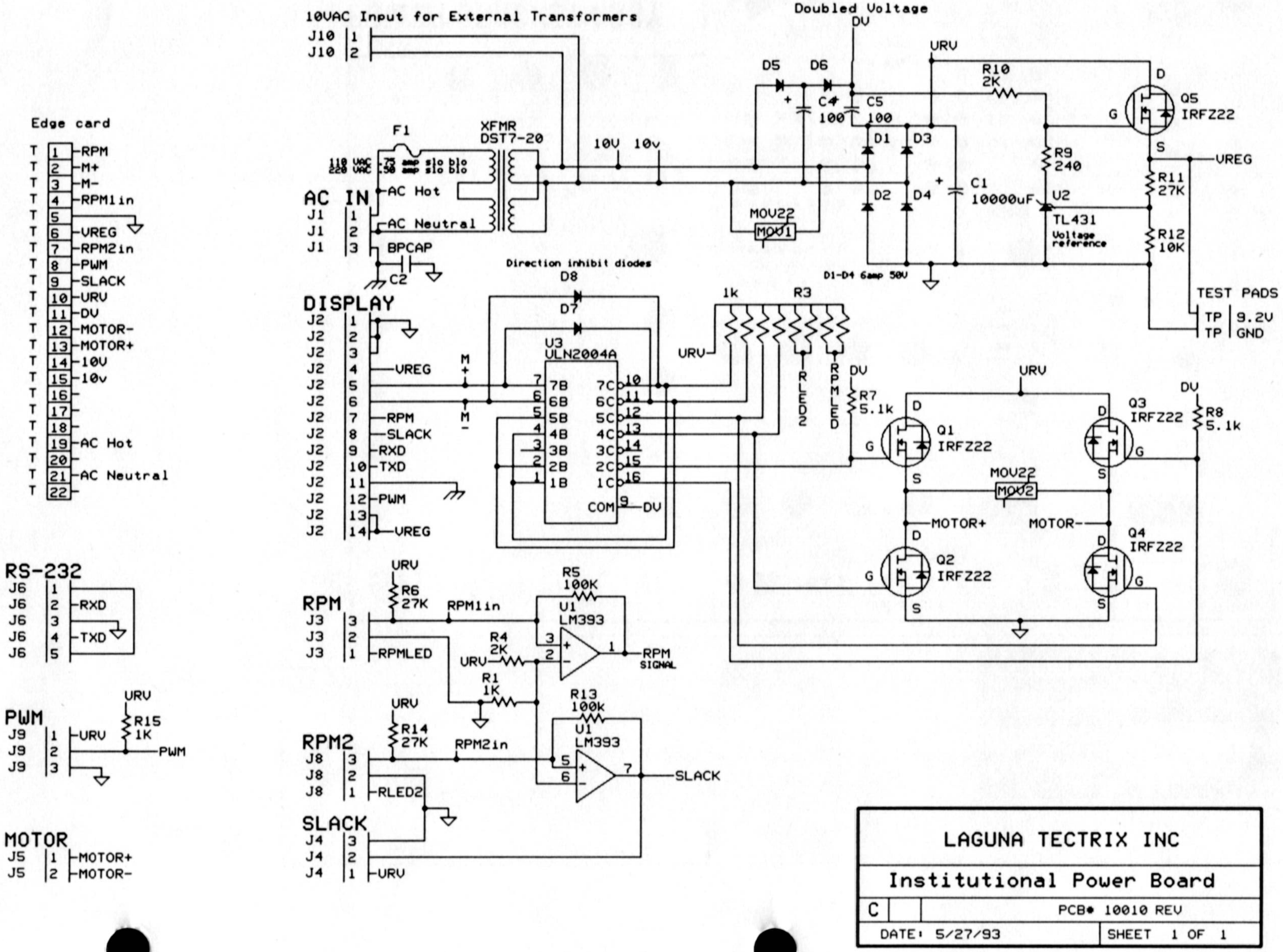

Ground Terminal
Warning: Replace with same type fuse. MDL 3/4
J10 10VAC
J3 RPM
J8 RPM2
J9 PWM
J1 POWER INPUT
F1
1
D2
D4
D1
D3
D1-D4 6amp 50v
C1
10000uf
IRFZ22 Q5
MOV1 MOV22
R3 1K
U3 ULN2004
1N4001's
1N4001's
J6 RS232
.22uf 250vdc
C2
XFMR
Q3
Q1
Q4
Q2
IRFZ22
IRFZ22
IRFZ22
IRFZ22
D7
D8
R7 5.1K
R8 5.1K
R1
R6
R4
1K
10K
2K
R14 10K
D6
R12
D5
2K
R10
10K
27K
R11
240
R9
100uf C4
100uf C5
SLACK J4
U1 LM393
U2 TL431
J5 MOTOR
MOV2 MOV22
100K R13
100K R5
9.2vdc
TEST POINT
GND
J2 ON BACK
DISPLAY

POWER BRACKET ASSY.
PART # 61130
Figure 16

Figure 17


10VAC Input for External Transformers
J10 1
J10 2
Doubled Voltage
DV
URV
D5
D6
C4 100
C5 100
R10 2K
D
G
S
Q5 IRFZ22
VREG
D1
D3
D2
D4
R9 240
C1 10000uF
U2
TL431
Voltage reference
R11 27K
R12 10K
D1-D4 6amp 50V
MOV22
MOV1
F1
XFMR DST7-20
110 VAC .75 amp slo blo
220 VAC .38 amp slo blo
10V
10v
AC IN
J1 1 AC Hot
J1 2 AC Neutral
J1 3 BPCAP
C2
TEST PADS
TP 9.2V
TP GND
Edge card
T 1 RPM
T 2 M+
T 3 M-
T 4 RPM1in
T 5
T 6 VREG
T 7 RPM2in
T 8 PWM
T 9 SLACK
T 10 URV
T 11 DV
T 12 MOTOR-
T 13 MOTOR+
T 14 10V
T 15 10v
T 16
T 17
T 18
T 19 AC Hot
T 20
T 21 AC Neutral
T 22
Direction inhibit diodes
D8
D7
DISPLAY
J2 1
J2 2
J2 3
J2 4 VREG
J2 5
J2 6
J2 7 RPM
J2 8 SLACK
J2 9 RXD
J2 10 TXD
J2 11
J2 12 PWM
J2 13
J2 14 VREG
M+
M-
U3
ULN2004A
7B 6B 5B 4B 3B 2B 1B
7C 6C 5C 4C 3C 2C 1C
COM 9 DV
1k
R3
URV
RLED2
RPMLED
DV
R7 5.1k
Q1 IRFZ22
Q3 IRFZ22
R8 5.1k
MOV22
MOV2
MOTOR+
MOTOR-
Q2 IRFZ22
Q4 IRFZ22
RS-232
J6 1
J6 2 RXD
J6 3
J6 4 TXD
J6 5
RPM
J3 3
J3 2
J3 1 RPMLED
R6 27K
RPM1in
R5 100K
U1 LM393
R4 2K
R1 1K
RPM SIGNAL
PWM
J9 1 URV
J9 2
J9 3
R15 1K
PWM
RPM2
J8 3
J8 2
J8 1 RLED2
R14 27K
RPM2in
R13 100k
U1 LM393
SLACK
SLACK
J4 3
J4 2
J4 1 URV
MOTOR
J5 1 MOTOR+
J5 2 MOTOR-
LAGUNA TECTRIX INC
Institutional Power Board
C
PCB# 10010 REV
DATE: 5/27/93
SHEET 1 OF 1

NOTES

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